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FERROMANGANESE PLANT
ABU ZENEIMA, SINAI

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STAGE I
PREFEASIBILITY
WORK REPORT

APPENDIX 7 AND 8

The Sinai Manganese Company

SIMANG

PREPARED BY

KAISER ENGINEERS AND CONSTRUCTORS, INC.

in association with

ARAB CONSULTING BUREAU

REPORT NO. 80-57-RE
SEPTEMBER 1980

APPENDIX 7

(III.E.)

Evaluation-Equipment/Facilities

Requirements

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o ACB Report
o Equipment Lists

Report on Abu Zeneima Townsite, Facilities, Residences, Public Buildings and Industrial Buildings

prepared by

The Arab Consulting Bureau

and

Hassan & Omar Nasseh Fawzy, Architects

GENERAL DESCRIPTION A1

(i) STUDY AREA

The total area of Abu Zeneima is aproximately 73.278 hectars. Area boundaries are as shown in Figure (1) and can be summarised as follows:

- The Gulf of Suez and the Red Sea to the south and south west of the study area.

- The main road from Suez to El Tor bounds the study area from the north, further north of the road exists a mountain range (Mt. MATULLA). The physical character of the area is mainly plain desert.

The study area is within the Southern Sinai Governorate.

(ii) ENTRANCES TO THE SITE

The study area can be reached by sea, air or land.

The main entrance to the site is a road to the north east branching from the Suez-El Tor highway due south to Abu Zeneima check point one. A secondry coastal road reaching west of Abu Zeneima is another access to the site although it is in a disused condition.

Abu Zeneima can also be reached by sea due to its position on the Gulf of Suez, ships coming from the Red Sea heading north, or from the Suez Canal heading south can stop at its pier, although not equipped as a port, the pier is, at present, mainly used for loading manganese.

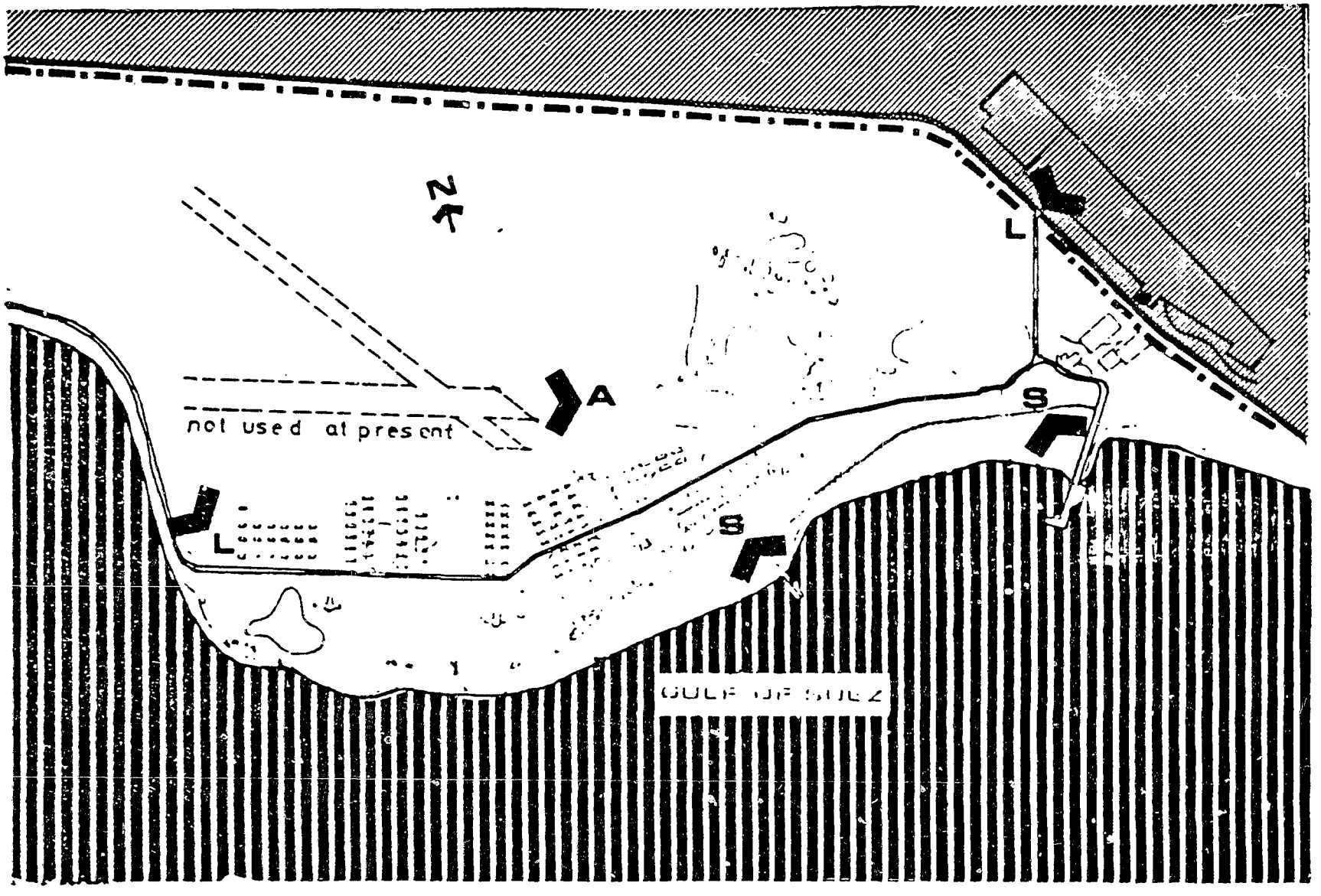


Fig. (1)

AREA BOUNDARIES

& SITE ENTRANCES

outside study area

area boundaries

site entrances

land, sea, air L, S, A

CONDITION OF BUILDINGS A2

The existing townsite facilities of Abu Zeneima can be devided into the following categories:-

- Residential area including both the new & old housing.
- Community services concentrated in the new community centre to the old site.
- Industrial area.

(i) RESIDENTIAL:

The existing residential area consists of the old buildings area built in 1947 and the newly built area, errected in 1967 just before the war.

The old buildings in general are in a very poor condition either completely or partially destroyed. It is to be noticed that their arrangement is lacking in any kind of planning, the buildings are too close to each other up to the sea, and since these buildings were to be demolished we find that some of the new buildings are also touching upon the old ones or awkwardly placed at a very small distance between them.

These buildings comprise the rest house of the pier manager, the old employees club, a group of 6 married employees villas, the old administration building, and the old sample analysis laboratory. Buildings in the mid-section are the old primary school, the headmasters quarters, 2 completely damaged married employees houses, the old ~~rest~~ o-fice and the old cinema, 6 workers quarters, the old custom's house, bakery, public lavatory, the old cooperative society building, the workers mess, the old ice factory, the old employees dining room, etc....

The new residential area: The construction work in this area was nearly finished just before the 1967 war. The buildings were built with reinforced concrete ceilings, with asbestos roofing on top to minimize the heat effect on the interior of the buildings, masonry walls, interior and exterior plaster and what may be considered as common finishing.

In general the structure of the buildings is in a good condition and liable to repairs, the sanitary equipment, lighting fixtures, doors and windows are as a rule missing, having been robbed by the natives in the area or as otherwise believed, destroyed by the inhabitants themselves at the ~~attack~~ ONSLAUGHT OF THE Israelies.

Residential area: (New buildings)
Consists of 4 types:

Type A: married executives villa's
Type B: bachelor employees quarters
Type C: married foremen and workers houses
Type D: bachelor workers quarters.

Table 1.

Type	Need repairs	Already repaired	Total No.
A	15	4	19
B	21	4	25
C	40	4	44
D	11	2	13

Type A: Villa type, for 1 family only (married executives) it consists of: entrance hall, living room, dining room, kitchen, maids toilet (external), 2 bedrooms, 1 bathroom.

Total area= 90 m^2 (without-terrace)
Terrace area=16 m^2

See Fig. (3) plan of type A.

Type B: Corridor type unit: units for 6 employees each. Each block consists of 6 bedrooms each with a private bathroom. At one end of the corridor is a kitchen at the other end a collective living room.

Type B_1: Same as type B in all aspects except that each two rooms share a bathroom. This type was formerly assigned to single foremen.

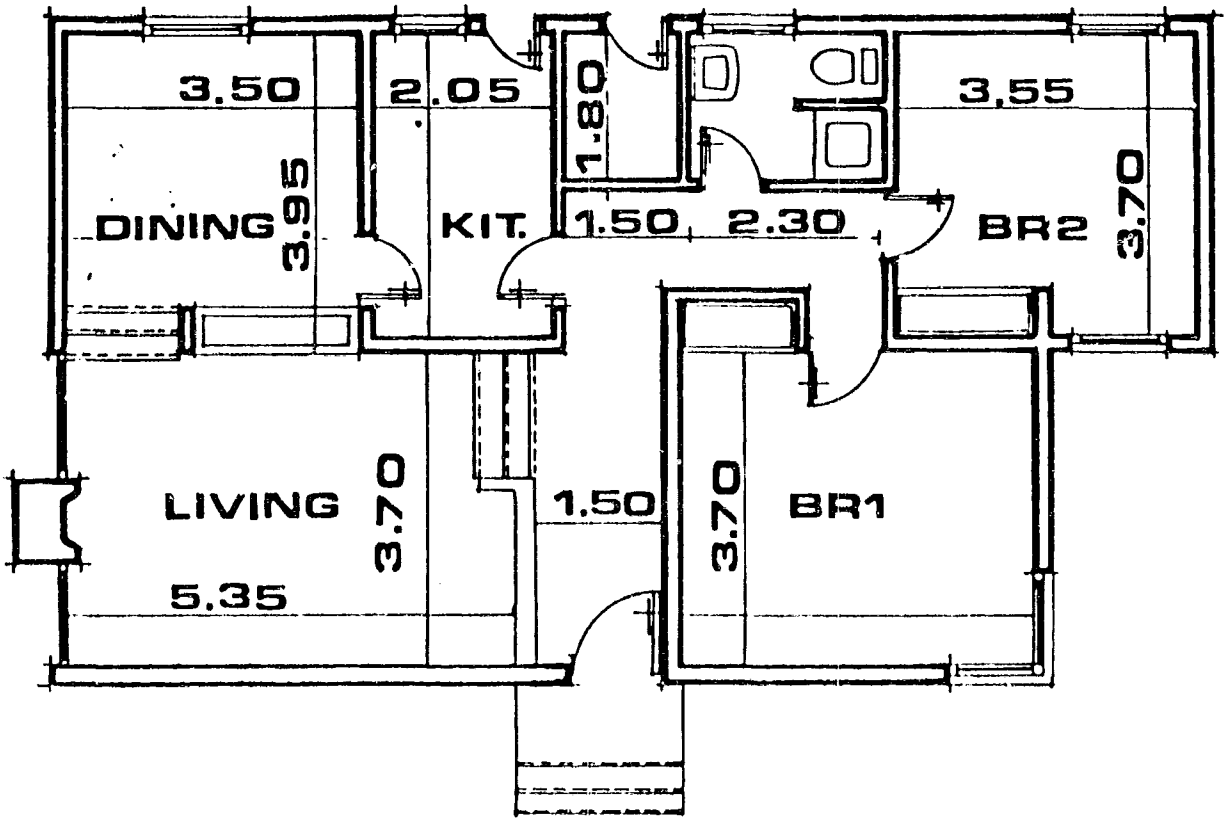
Total area of block = 180 m^2
area/room = 10 m^2 + 4.6 ent. half
+2.55 bathroom.

See Fig. (4) plan type B & Fig. (5) plan type B_1.

Type C: 2 semi-attached villas. 1 villa per family i.e., each block for two families, consists of living-dining area, kitchen, bathroom and 2 bedrooms.

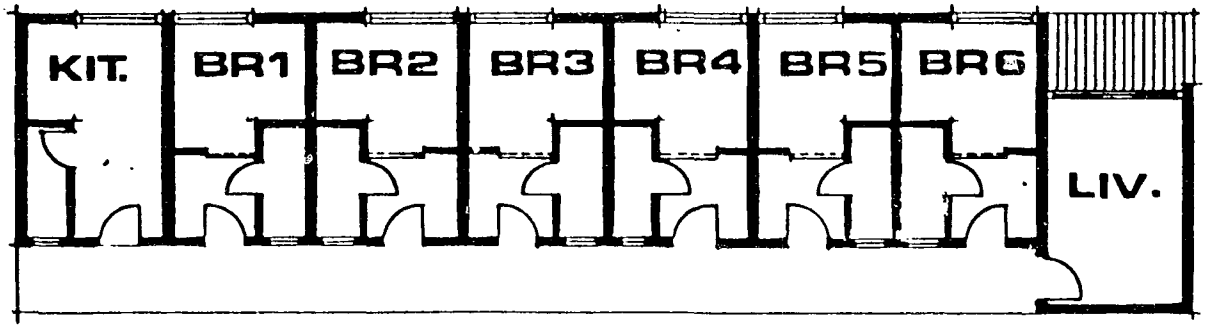
Total area of block = 100 m^2
50 m^2/villa.

See Fig. (6) plan type C.

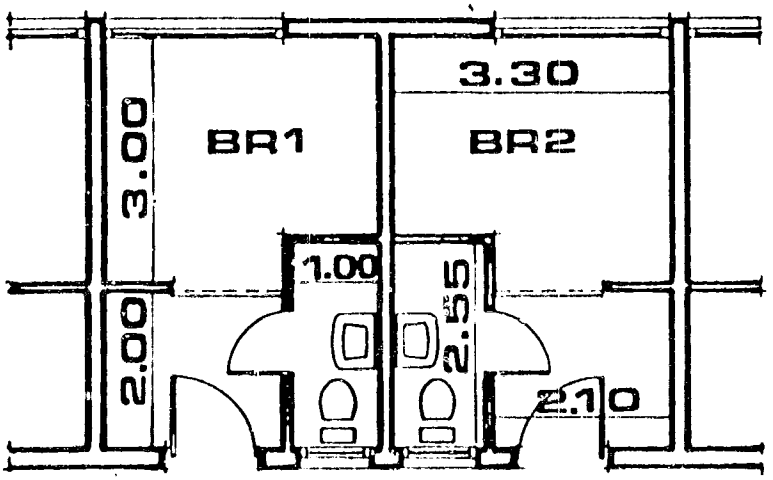


TYPICAL PLAN TYPE A
VILLA'S FOR MARRIED
EXECUTIVES

Fig (3)

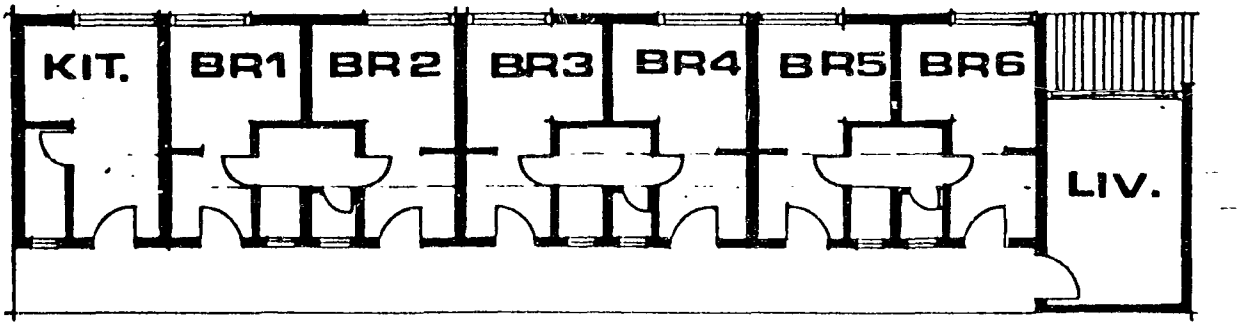


TYPICAL PLAN TYPE B
FOR BACHELOR EMPLOYEES

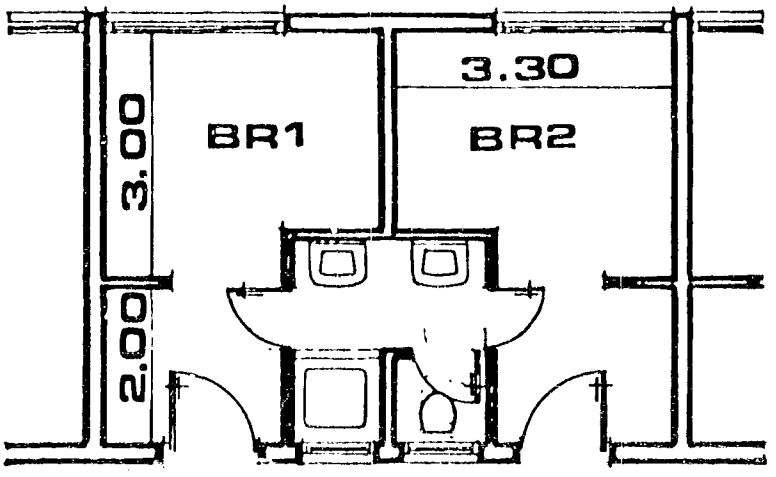


PLAN OF TYPICAL BEDROOM
TYPE B

Fig (4)

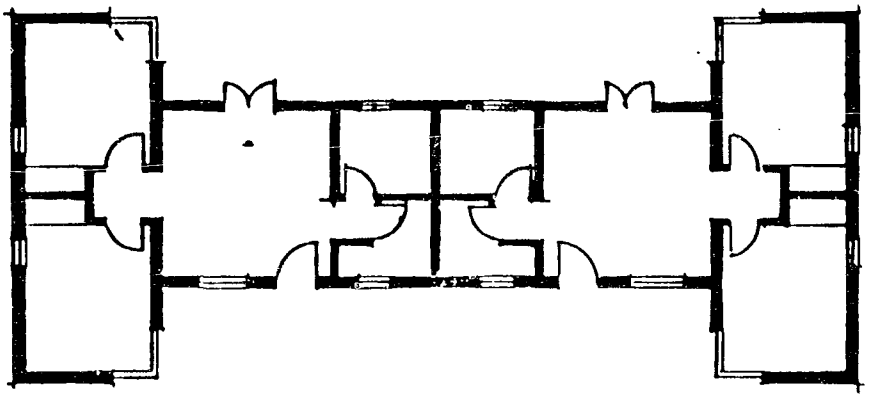


TYPICAL PLAN TYPE B1
FOR BACHELOR FOREMEN

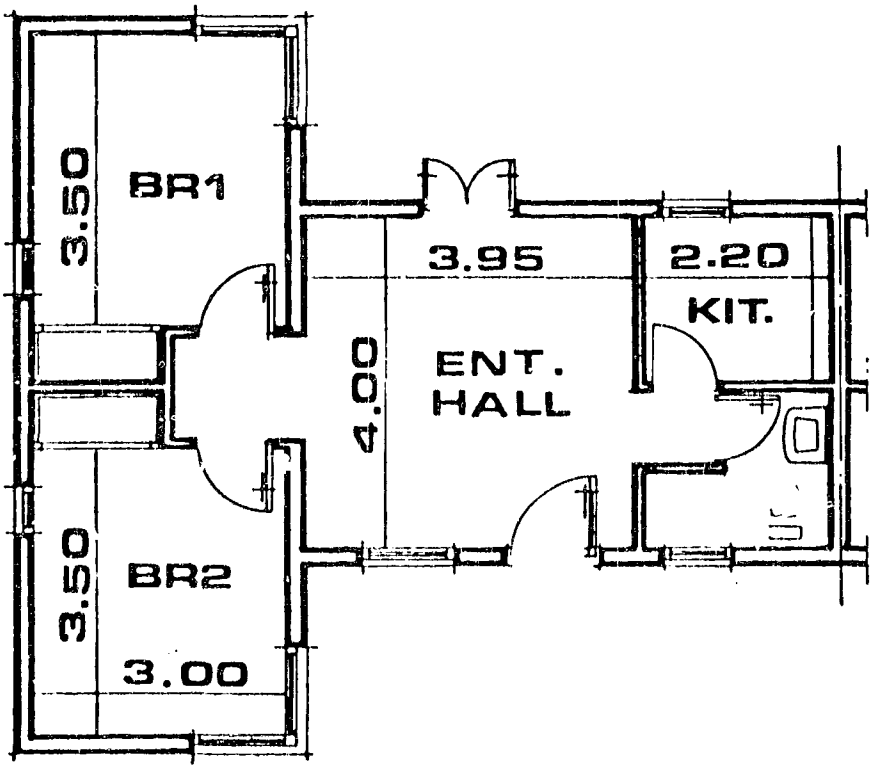


PLAN OF TYPICAL BEDROOM
TYPE B1

Fig (5)

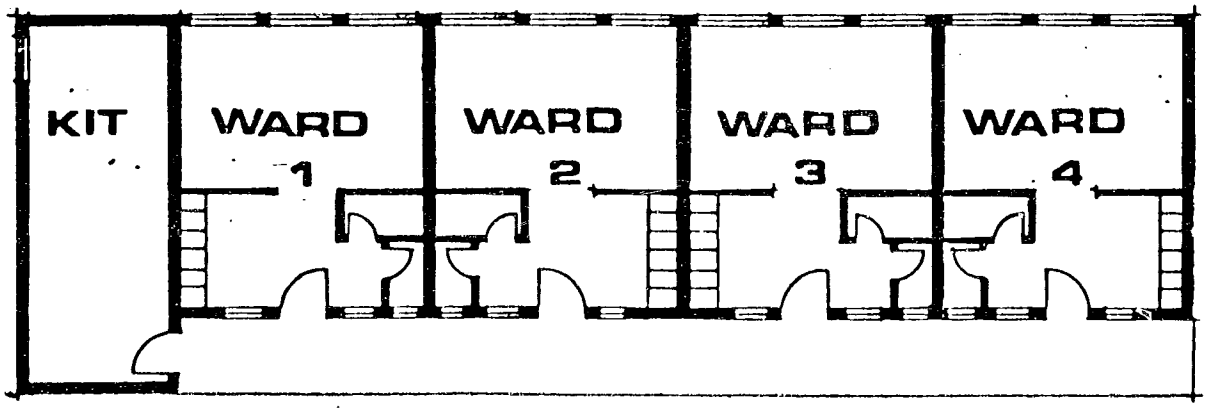


TYPICAL PLAN TYPE C

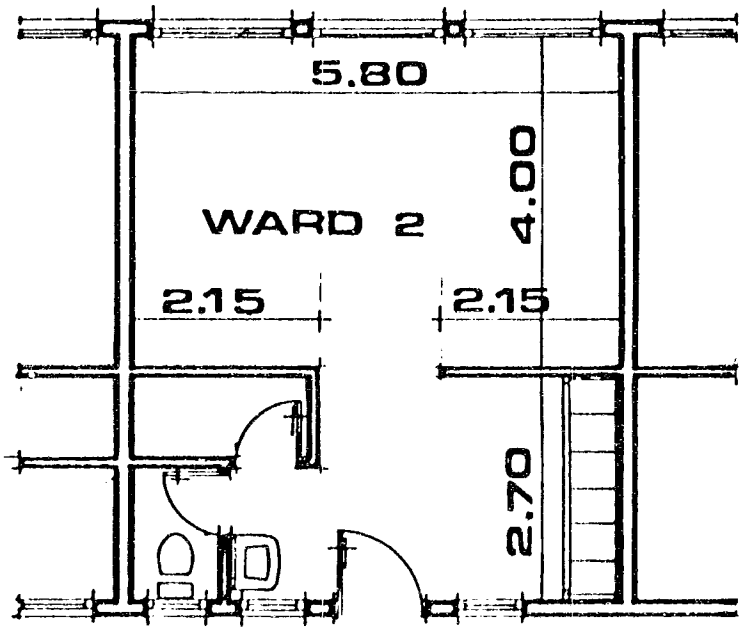


TYPICAL HALF-PLAN TYPE C
FOR MARRIED EMPLOYEES

Fig (6)



TYPICAL PLAN TYPE D
FOR BACHELOR WORKERS



PLAN OF TYPICAL WARD
TYPE D

Fig (7)

Type D: Corridor type with 4 big bedrooms. Each room can accomodate 6 workers and has an ent. hall with six wall closets and 1 bathroom. See fig (7)

The block (4 rooms x 6 workers) for 24 workers has a communal kitchen at one end.

Total area of block = 234 m^2

Area/B.R. = 24 m^2 + ent.hall + W.C.+shower.

Chairman of the board villa: A 2-storey villa.
Total area = 200 m^2 approx.

~~See Fig. (8) showing the state of repair or damage of each building.~~

From Table 1:

- Type A - 4 buildings have been renewed and furnished together with the lighting appliances, and sanitary fixtures piping etc..., and are already inhabitated by employees from Sinai Manganese Co.

- Type B - 2 blocks, i.e. 4 houses have been repaired and furnished and are in a good condition.

- Type C - 2 blocks, i.e. 4 houses have been repaired internally and externally and are currently used as an office by the consultant, only office furniture is to be found there.

- Type D - two of three blocks have been repaired and are currently used by the workers in the site.

- Most of the buildings type C have cracks in the two perpendicular walls on one side of the house near the corner window running from the corner window to the floor causing settlement of the floor. It is noticed that the flooring is cracked in many instances.

- The masonry is intact in all houses with the exception of a few back walls of some of the houses type B which it seems have been war-damaged.

- The reinforced concrete ceiling is in a good condition but the asbestos roofing was removed or blown away in many cases.

- External plaster is in a reasonable condition except for some bullet marks and in a few cases some cracks, but it could be repaired. Internal plaster is in a worse condition many of the houses need new plastering while others need repairs and painting.

- Most of the tile flooring is preserved in a good state except for the settled floors of the above mentioned houses and a small number of rooms with decayed or destroyed timber flooring in the executives villas.

- In general most of the doors and windows have been either stolen or removed and are missing, the same applies to all sanitary appliances and lighting fixtures and the water tanks on top of the buildings.

EDUCATIONAL

As in many other parts of Egypt, and Sinai in particular, the study area is deficient in the level of provision of educational facilities. The only existing school in Abu Zeneima is a primary school located in the central old sector. The building itself wasn't designed for being a school, it was an ordinary house later converted into a school, it consists of eight classrooms all built from wood (both ceiling and walls), and was partially ruined during the war.

A school of that size would not be sufficient for every eligible child. As regards preparatory and secondary schools, there aren't any available in study area and older students were formerly obliged to go to school either in Suez or Cairo.

HEALTH CARE

Health care is also a cause for some concern in that there is only one small hospital, which is government property and is now locked up and disused. No pharmacy exists, no private doctors practice in Abu Zeneima.

The hospital was partially damaged during the war, but is in the process of being-repaired by the Ministry of Health since it is government property owned by the ministry. Being a government property, the consultant has no authority to recommend the removal of the hospital, which is inadequately placed from the planning point of view, but he can recommend vertical or horizontal expansion, so as to fulfill the required standard of health care.

SOCIAL AND RECREATIONAL

Existing social and recreational facilities include: the social club for executives the sporting club for workers, the cinema and open-air theater, the Mosque.

- The Social Club

  Located in the south western part of the study area, a two storey building, the ground floor consists of an entrance hall with a large staircase leading to the first floor, the entrance hall leads to these lounges, one is a dining hall with direct access to the main kitchen.

  The first floor consists of 6 bedrooms each two sharing a bathroom, to be used as a hotel or rest house for executives spending the night over at Abu Zeneima.

  The building is in a fairly good condition with the exception of the doors and crittal windows which are missing as well as all sanitary fittings and pipe work, electrical fixtures and wires, venetian blinds missing in ground floor lounges.

- The Sporting Club

  The architectural design of the sporting club is similar to that of the social club although differing in finishing materials. The building has been repaired and will only need painting for the internal walls.

Traces of the playfields, such as football fields, basketball, handball, and tennis fields are evident although they are in a state of neglect together with the absence of vegetation.

Cinema and Open Air Theater

Located in the vicinity of the sporting club, the cinema and open air theater lack the seating, the concrete flooring is in a bad condition due to weather effects and it requires a layer of screed. The screen and stage must be repaired. The projection room lacks the projection equipment, the room needs external and internal plastering, stairs are still concrete and need finishing materials for the steps and a hand rail, also the door and windows are missing.

The screen and stage are in a very poor condition, requiring repairs in plastering and flooring.

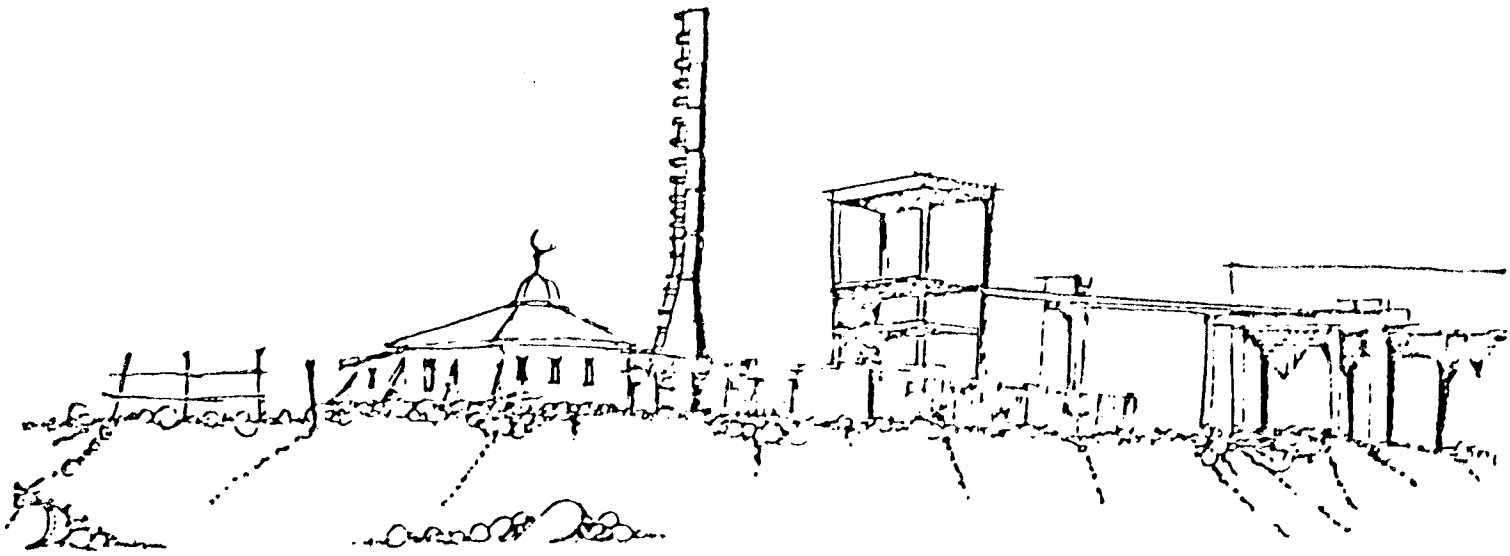
To the back of the stage is a small building consisting of three rooms and a corridor of bathroom. This building has been repaired recently and is in use, although it needs some repairs of the external and internal plaster.

THE MOSQUE

The existing Mosque is located near the smelter, its shape is octagonal. Inspite of being recently painted, cracks appear on its walls and the building itself is worn out by age.

In the new Abu Zeneima master plan in 1966 it was recommended that the Mosque be removed, but due to supersticious beleifs this action was postponed.

Being near the smelter area and thus far from the new residential buildings, it is recommended that the Mosque be removed and a new larger Mosque be built near the center of the study area.



View of the Mosque and the Smelter

CIVIL AND ADMINISTRATION BUILDINGS

The study area lacks several civil and administrative buildings such as police station, fire station, ambulance station, post office, bank etc.., which are considered most essential for an industrial community such as the study area.

The only existant building in this category is the administration building.

The existing post office was not originaly designed as a post office, but as a matter of fact, one of the married workers houses located on the main road was convereted into a post office.

No actual police station existed in Abu Zeneima, but a small enquiry office was in use before the Israeli occupancy. One of the married executives villas was assigned as the residence for the chief of police.

A coastal guards post lies on the western sector of Abu Zeneima,it consists of two buildings, both were seriously damaged during the war and are not the property of Sinai Manganese Company.

ADMINISTRATION BUILDING

The only four storey building in Abu Zeneima, built before 1967 to replace the old administration offices near the pier in the old sector. The new administration building is located on the north sector of the study area, west of the smelter.

The building itself consists of two ~~mines~~ WINGS, each containing a group of offices.

The ground floor includes an entrance hall with information counter and a lounge, and open staircase leads to the upper floors, each floor contains a number of offices in each ~~mine~~ WING, a public lavatory and a private water closet and shower for the office of an executive.

The building in itself is in a very good condition although the doors, closets and glass for crittal windows are missing. Also sanitary fittings, electrical fixtures, wood handrail for staircase are absent. Some repairs of interior plaster and painting are needed but otherwise the building is in very good shape. The building has no parking space in the surrounding area.

COMMERCE AND INDUSTRY

Commercial buildings include:

- Public restaurant
- Shopping center

While industrial buildings include:

- The smelter
- Water desalination plant
- Electrical station
- Ice factory

- Ware houses
- Work shops
- Gas station
- Garages

The Public Restaurant

Located in the central sector of Abu Zeneima, the one storey building is divided into a main dining room, large kitchen and lavatories.

The main dining room is a hinged frame construction carrying a reinforced concrete sla[illegible] The external facade was designed to be a curtai[illegible] wall of cr[illegible] and glass, but was removed during the war, an[illegible] main aisle was used as a shelter for Israe[illegible] tanks.

The entrance door to the public restaurant is missing as well as all other doors and windows.

The kitchen is divided into several sectors for prepairing and cooking togethe[illegible] storage area.

All kitchen sinks are brocken, all glass is missing as well as all kitchen equipme[illegible] tensils.

Two public lavatories are on[illegible] entrance hall, all W.C.'s, ur[illegible] and wash basins are either brocken or missing.

Shopping Center

The shopping center was one of the few incomplete buildings before the 1967 war, it lies to the north of the public restaurant. being L shaped in design it includes a bakery, two big shopping spaces intended to be department stores, 4 small shops. Some shops need external plastering, while others need internal plastering as well.

The capacity of the shopping center at its recent stage is not sufficient for the number of shops actually needed, and further horizontal expansion is recommended.

Ice Factory

It is a single storey building located opposite the single labourers' blocks on the other side of the main street. The construction, columns, ceiling are intact, a front wall and a side one were damaged.

The cooling tower is in good shape except that the metal louvers are missing. The concrete cooling beds are partially destroyed. The insulation material is completely destroyed (cork) and the main gate is missing together with all the glass of the windows.

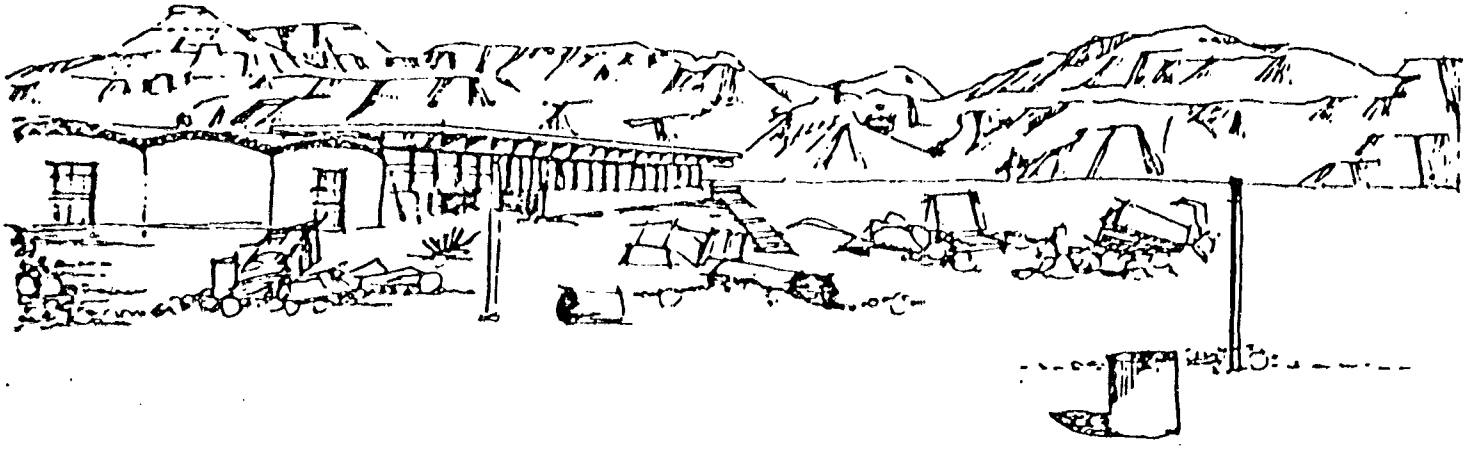
WAREHOUSES AND WORKSHOPS

The storage and service area lying east of the study area can be reached by the main entrance road which branches at the entrance check point into two secondary roads one heading west to the industrial and residential area, the other heads east to the storage and service area. This area comprises the warehouses, and workshops.

The warehouse is of a total area 374 sq. met. with dimensions 8.5 m x 44 m.

The workshops include:

- The mechanical workshop
- Car maintenance workshop
- The main plant workshop.

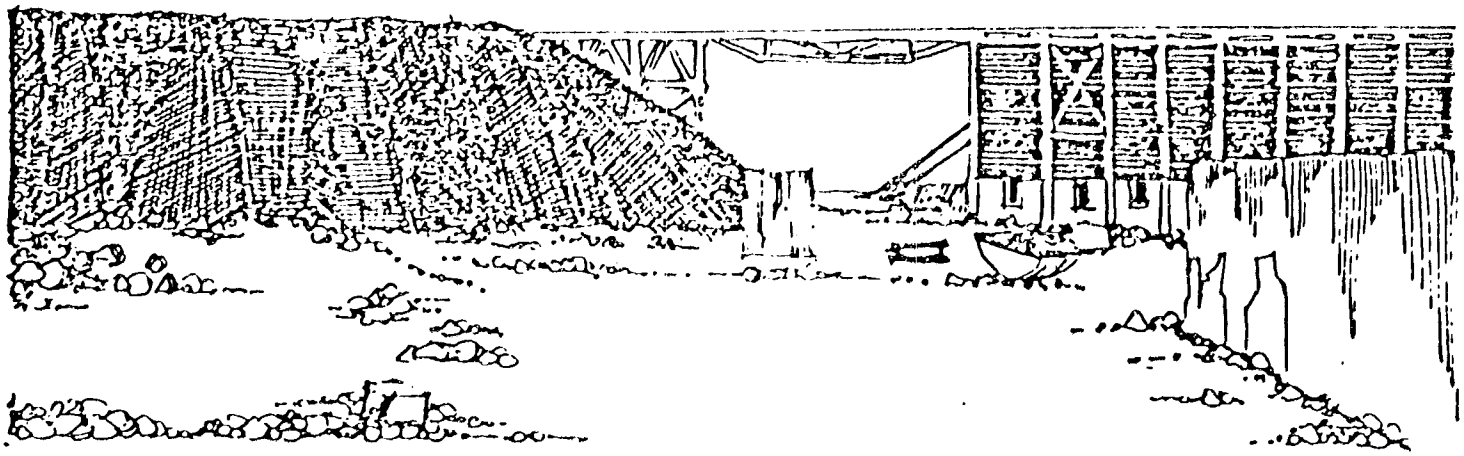


VIEW OF WAREHOUSES & GARAGES

The workshops are in an excellent condition with only glass for windows missing. Total area of each workshop is approx. 940 sq. m. Total area of main building (4 workshops) is aprox. 3772 sq. m.

A car park with a shed for 38 cars and a petrol station is the only means for petrol fueling in the area. The garage is to the north of the shed 76m long.

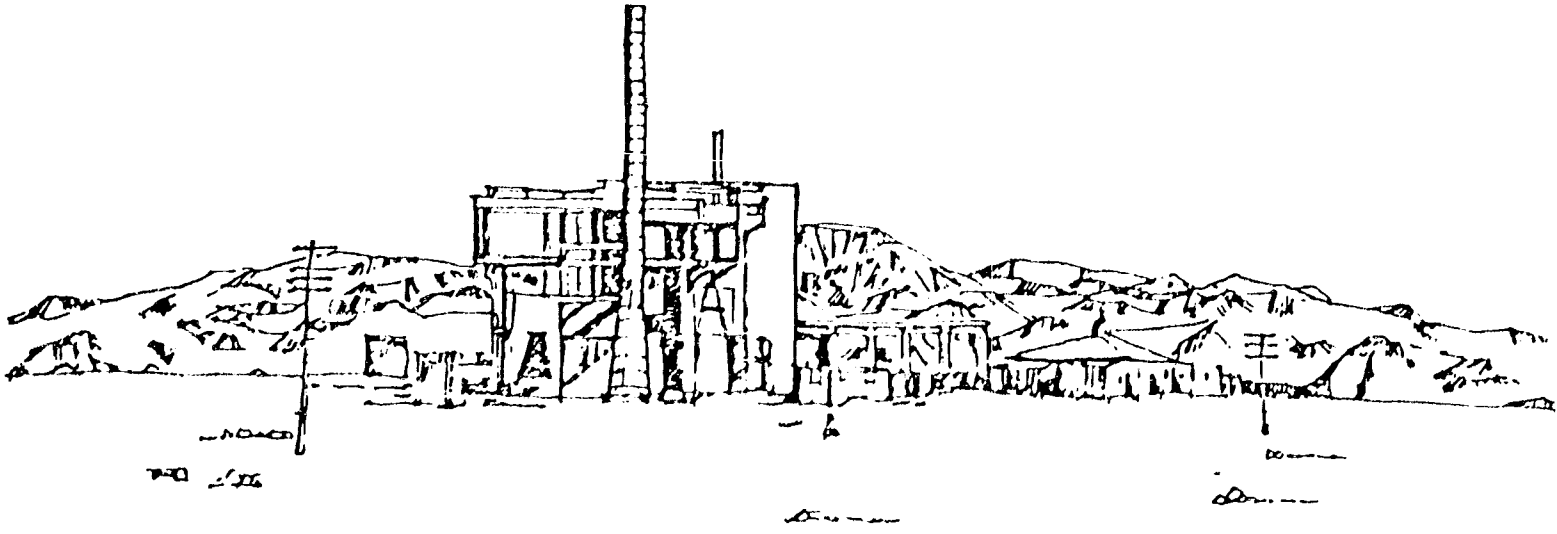
The old petrol station is severly damaged. It is the property of the Cooperative Societe for Petrol, located near the warehouses and workshops. The building is a two storey building with reinforced concrete slabs and columns, masonary work as infill. The underground tanks are totaly damaged, the building itself is in a bad condition, all doors and windows are missing, the pumping machines are damaged as well.



VIEW OF BUNKER & MANGANESE ORE

SMELTER

The smelter is located in the main industrial area along with the water desalination plant and the electrical power station, the smelter consists of 3 main buildings, the bunkers, the burner, the rotary kiln, of these buildings we are mainly concerned here with the burner building which is a three storey building of reinforced concrete framework without masonary work infill. The brick wall of the transformer room is damaged. The Mosque lies to the south of the smelter and constrains the smelter from future expansion in the south direction.



VIEW OF THE SMELTER AND THE MOSQUE

DESALINATION PLANT

The desalination plant is in the vicinity of the electrical power station, the total plant was diswanted mantled during the war and transported elsewhere. The existing suilding needs repairs such as doors and windows, sanitary and electrical fittings etc...

The only source of potable water at the moment is by means of tanker trucks from Suez.

ELECTRICAL POWER STATION

The electrical power station is located to the north of the study area. The building was subjected to severe damage due to fire and explosions on the eastern side of the suildings, in thus sector the reinforced concrete slab and beam were totaly damaged, the overhead crane bridge was also affected by the fire. However, disregarding the eastern facade, the building is in a very good condition, only devold of the dodors, glass for windows, steel doors, sanitary works and electrical fittings, handrail for elevated platform.

Electrical tower is currently provided by small portable diesel generators.

LANDSCAPING A3

The study area's main feature is the total absense of any type of cultivation, this fact is mainly due to its closeness to the sea, the negligence during the war occupancy years and to the non fertility of the soil.

No parks or playfields are evident, no sidewalks or sidewalk trees can be seen.

The court yards of houses do not include any kind of vegetation.

All these facts help in creating the characteristic feature of the study area of being a plain arid desert.

ROAD NETWORK A4

The existing road network can be seen in Fig. (9). The main entrance road branches from the Suez El Tor highway, is a single lane road in a good condition till it reaches the entrance check point, it then branches into two roads one heading east to the gas station and workshop, the other goes west passing through the centre of Abu Zen-ima. This road is in a bad condition and should be repaired. There are traces indicating that there had been secondry traverse roads, pouring into the main internal road going from east to west and biseeting the study area. The road surfaces are very poor consisting mainly of unconsulidated loose sand and apparantly little particles of asphalt can be seen in some parts.

No paved side walks exist at present, just plain sand side walks with no trees, awnings or seatings.

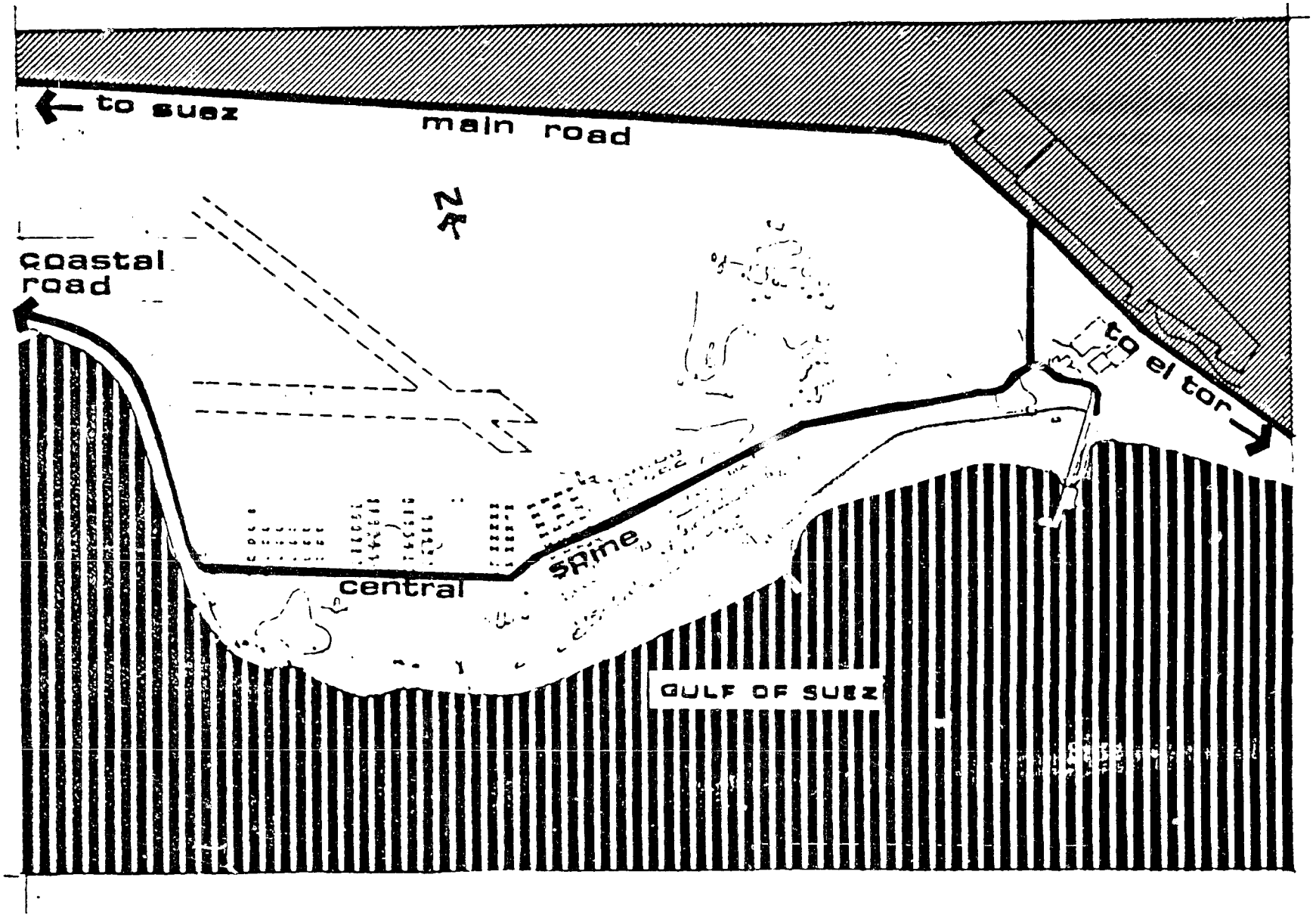


Fig (9)

EXISTING

ROAD NETWORK

existing roads ——

INFRA-STRUCTURE A5

Water provision consists of a piping system network starting at the water tanks near the desalination plant leading to all the buildings. Sea water is transfered to the desalination plant through a large pipe located near the pier, the potable water is then stored in the water tanks, then transfered to the suildings via the pipe network. This system is now not in use, for part of the pipes are missing, the desalination plant is damaged and the only method of water provision now in existance is by means of water tankers arriving daily from Suez, filling the $1m^3$ water tanks on the roofs of the already repaired residences.

The sewerage network consists of soil pipes from inspection chambers near the buildings leading to the main sewer pipes.

The sewerage network is totaly damaged, main pipes have been removed, inspection chambers are filled with sand and have no LDS.

The existing electricity distribution network is not in use because the electrical power station has been severly damaged, a small electrical generator is the main electricity source it is placed in a warehouse in the north sector of the study area.

FUTURE EXPANSION

Fig. (1) shows the natural boundaries of the study area, the Gulf of Suez from the south and west will constrain any future expansion in that direction. The mountain range and main road to the north leave only one direction for future horizontal expansion which is to the east of the existing Abu Zeneima. See Fig. (10).

Another proposed solution for expansion is the vertical expansion for residential buildings which are mainly one storey high and can be increased to two, three or four storey's, and this can be easily achieved because all new buildings are constructed from reinforced concrete.

CONSTRAINTS

Two major natural constraints to future growth in the study area are the Gulf of Suez from the south and west, the mountain range and the main Suez-El Tor highway to the north.

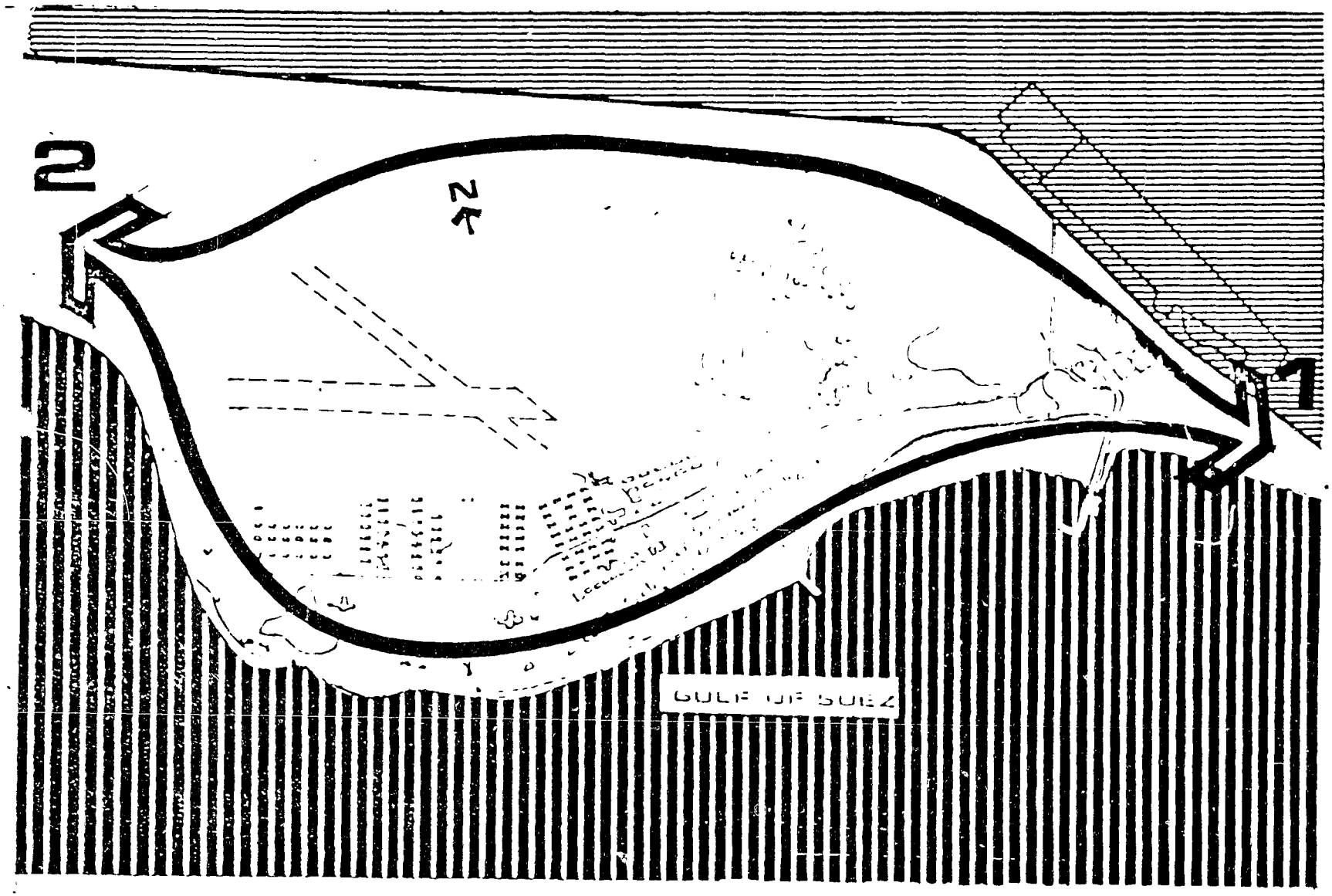


Fig (10)

FUTURE EXPANSION OF ABU-ZENEIMA

1 natural direction for expansion

2 possible limited extention

PART B

CURRENT REQUIREMENTS

SERVICES B4

The well-being of a community is sustained and enriched through the usage of various types of facilities.

It is important, however, to predict the needs of the community and assign sufficient floor spaces for each facility or service. In the following items, our predictions were based upon planning standards and design criteria for the needs of a community of less than 4000 inhabitants.

COMMERCIAL

The standard requirements of a community of a size as that of the study area (1041 inhabitants) would not theoreticaly include whole saling establishments, specialised retail shops etc.. But would include only local level shoppping which consists mainly of small shops dealing with every day household needs, it is usually estimated that 3 to 5 shops are assigned for every 1,000 inhabitants.

But in the case of an isolated community these standards cannot be achieved, mainly because there are basic needs for any community however small it may be, thus the requirements for commercial shops in the study area would be:

Grocer, Butcher, BAker, Pharmacy, Bookshop, Barber, Cooperative Society, Department store, Supermarket.

There will also be a number of small workshops dealing with repairs and maintenance such as an electrician, a plumber, etc... A small market should be available for every 1,200 households.

EDUCATIONAL

According to acknowledged standards and design criteria an elementary school (ages from 4-6 years) and a primary school (ages from 6-12 years) is needed for a community of 4000-5000 4-5,000 inhabitants.

Although the proposed community size for the study area is much smaller than the 4,000 inhabitants level it is required that an elementary school and a primary school be erected to accomodate all eligible children. The primary school may contain a minimum number of 6-8 classrooms, the elementary school can be attached to the primary school.

No secondary or preparatory schools are required according to the standards which place them as per 20,000 inhabitants for the latter and 1 per 80,000 for the former.

HEALTH CARE FACILITIES

First aid centres serve a catchment population of 20,000 on a city scale such centres each house two practitioners and a medical assistant. It is advisable that and emergency ward exist in an industrial community however small it may be and a clinic with at least one resident doctor.

RELEGIOUS

A local Mosque is needed per 5,000 inhabitants. The Mosque may include a relegious school.

CIVIL AND ADMINISTRATIVE

The civil and administrative facilities are mainly government services. According to standards and design criteria a local post office is required per 5,000 inhabitants, a local police station per 20,000 inhabitants.

A fire station is a basic requirement mainly for the industrial area, and can serve the residential area as well, it can serve a 3 km radius.

OPEN SPACE

Local open space requirements include private open space (front yards and back yards of residences), communal open space (space formed between housing clusters) and main open space such as parks and palyfields. The standards of space provision indicate that local open space consisting of:

i- Requirement for small parks and playground areas will be about 0.2 ha. per 1000 inhabitants which is approx. equal to the estimated number of inhabitants in the study area (1041).

ii- Larger parks, hard pitches etc., the requirement is about 0.2 ha. per 1000 inhabitants.

By adding the two components the local open space requirements would be about 0.4 ha.

RECREATIONAL

The acknowledged standards and design criteria cannot be taken as a correct basis for recreational requirements, due to the fact that Abu Zeneima is a remote industrial community, and adequate incentives have to be provided to maintain its personnel on a permanent basis and to minimize labour turnover, for this reason recreational facilities are required such as cinema, theatre, club, sporting facilities, people's cultural palace, etc....

Standards for industrial settlements: (table 8)

Subdivision of space (%)	
Residential	63
Educational	4
Community facilities	3
Commerce	2
Light industry	5
Open space	15
Roads	8
Total	100

Gross settlement density (person/ha.)	191
Average net residential density (persons per ha.)	302

PART C

REPAIRS & RECOMMENDATIONS

BUILDINGS C1

RESIDENTIAL

(i) Demolitions

The group of old buildings, clustered near the ore stockpiles, bins and ship loader are made of mud b ick and masonry, others in the mid section near the sea are made of masonry and wood trusses. Most of these buildings are obsolete, roofless and in obvious disrepair, most of these buildings are to be demolished since their restoration would almost cost as much as building new houses and also because of their inappropriate position close to ore stockpiles. However some of them are to be selectively razed. restored or converted to storage or other uses connected with the bin and shiploader nearby.

(ii) Repairs modifications and requirements

From table (1) we gather that a certain number of houses has been repaired recently and are currently being used. These constitute four type A villas, four type B building, four type C houses and two type D blocks with a total of fourteen buildings. The rest of the buildings in the new residential area, of the four above-mentioned types need repairs that can be summed up as followed: partial and sometimes complete installation of asbestos roofing, all the sanitary fixtures and internal piping all the lighting fixtures and wiring, a large percentage of the doors and windows are missing and new ones

should be supplied, however most of the frames are intact and only window and door panels, glass, and wire mesh would be supplied. External plaster needs minor restoration, but new internal plaster will have to be applied together with oil or plastic painting, especially that the wiring is in a very poor condition and rewiring renewing the houses will involve further damage of plaster. Only a very small percentage of the masonry and the flooring need repairs in the residences.

Furniture will have to be supplied to all the residences together with kitchen appliances, refrigerator, stove, water heater for the bathroom etc.. with the exception of some 8 or 10 buildings that have been refurnished.

EDUCATIONAL

The ideal location of the primary school is undoubtedly at the physical centre of activity of the community it serves. The site proposal is shown in Fig. (12). The planning measures taken into consideration in choosing the site were:

i) Safety factor: the school siting requires no crossing of main or secondry roads.

ii) Immediate pedestrian access to the site from the surrounding residential area. The walking distance from the proposed site to the furthest household in the neighbourhood does not exceed 300 meters.

iii) Availability of open space to accomodate children during breaks, as well as playing fields. It also provides a future expansion potential. The playing fields could be shared with the surrounding residential area during summer vacation.

A minimum of 8 classrooms is recommended, each classroom would hold 25-30 pupils.

An elementary school is attached to the primary school, with a minimum of 3 classrooms for children from 4-6 years.

It is the consultants proposal to construct a technical training school in Abu Zeneima to help teach the unskilled labourers and youths from surrounding areas such crafts as; woodwork, welding, etc... To provide the local demands for skilled workers as, mechanics, electricians, welders, carpenters, blacksmiths.

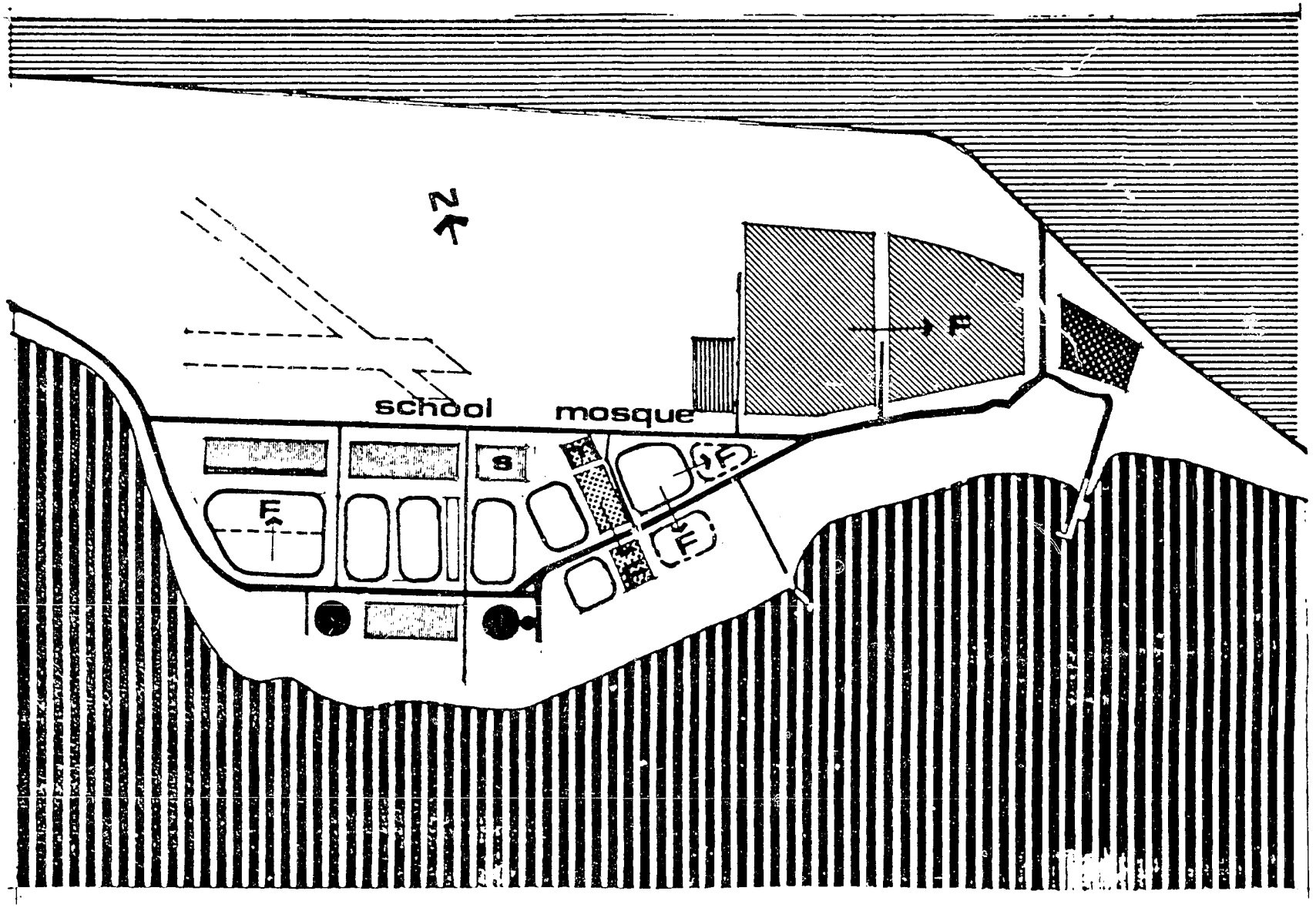


Fig. (12)

MAIN ELEMENTS

OF DEVELOPMENT

PLAN

housing

commercial

industrial

warehouse

recreation

open space

civil & admin.

future ext. F

This school can absorb part of the indigenous population of Sinai and eventually supply the plant with skilled and semi-skilled labour which for the time being is being recruited from Cairo.

HEALTH CARE

It is proposed that the existing health care facility, which is located in the southern sector of the study area, is expanded by adding an emergency ward to the already existing wards.

This ward would be available in cases of casualities in the industrial zone.

An ambulance service is also required with only one ambulance car to cover the whole area and the nearby areas.

A pharmacy is a necessity and should be placed in the commercial zone.

Work commenced recently in the repairs of the hospital, new doors and windows have been fitted. These repairs are being financed by the Ministry of Health.

The existing health care facility is entended to serve out-lying areas in addition to the study area.

COMMERCIAL

A total of six small shops will be needed in addition to the well established shopping centre, which already contains 4 small shops, 2 supermarkets and 1 bakery. The future expansion of the commercial facilities can be either by extending the existing facilities or by building a similar shopping centre on the opposite side of the arterial bisecting road.

Repairs needed for existing facility include: external plastering, internal painting, provision of doors and windows, repairing the pipe works and installation of the sanitary fixtures, electrical fittings, provision of glass for windows, shop signs,etc.....

The small shops needed to serve the community will be: butcher, grocer, bookshop, haberdasher, plumber, electrician, pharmacy, etc..., each shop of minimal area 12-15 m^2 storage area included. A covered market for fruit and vegetable stalls is to be provided near the centre.

The public restaurant required intensive repairs especially the crittal curtain wall on the main facade, all doors, and glass for windows should be installed, the kitchen sinks and sanitary fittings, the electrical fittings.

The flower box on the main facade must be repaired, kitchen equipment purchased and installed.

According to standards and design criteria the existing commercial facilities are quite sufficient except for the number of small shops required.

SOCIAL AND RECREATIONAL

The sporting club has already been repaired along with the 4 residential blocks previously mentioned, but it lacks all playgrounds such as football field, basketball, tennis courts, etc...

The social club requires fundamental repairs. A list of repairs needed include internal painting, doors and windows, venetian blinds, pipe work and sanitary fixtures, electrical works to be checked and repaired, kitchen equipment to be installed.

The cinema and open air theatre: the projection room equipment must be purchased and installed, external plastering is required as well as internal painting, doors and windows, staircase handrail, steps to be covered by finishing material.

The main seating area must be repaved and covered by a layer of screed. Seatings must be conveniently fixed in the ground. The main stage and screen must be repaired.

A new Mosque is proposed in the central sector near the main shopping centre and close to the residential area. The Mosque may include a religious school.

OPEN SPACE

Recreation provision was totaly deficient in the study area, the proposals include three types of open space:

i) Sports and play facilities: a minimum of 0.2 ha. was allocated for sports and playfields "kick-about" areas are located close to the primary school.

An equipped sports area is proposed for the sporting club.

ii) Private open space: we recommend that the client encourages the residents to plant new areas in their front or back yards.

iii) Parks: gardens with footpaths for walking and recreation are also proposed in the area seperating the workers semi-detached houses and the employees quarters.

MUNICIPAL AND ADMINISTRATIVE

The administration building is in a very good condition and requires only partial repairs.

As the number of existing offices exceeds the number of staff personnel estimated, no further extension for office space provision is required.

The repairs needed include: doors and glass for crittal windows, plumbing, installation of sanitary fittings, checking of electrical circuits, installation of electrical fixtures, internal painting, handrail for staircase and replacement of few brocken steps.*

---

* For further details see bill of quantities.

The building lacks a parking area for at least 10 cars.

The study area is deficient in the provision of municipal buildings, a post office is recommended in the central area at the shopping centre.

A police station, and a fire station are both proposed in the industrial zone.

The fire station can serve mainly the industrial area where accidents are liable to occur, as well as the residential area. The proposed road network makes it possible for a fire truck or an ambulance to reach as near as possible to the plagued area.

A police station may also serve the out-lying areas in addition to the study area.

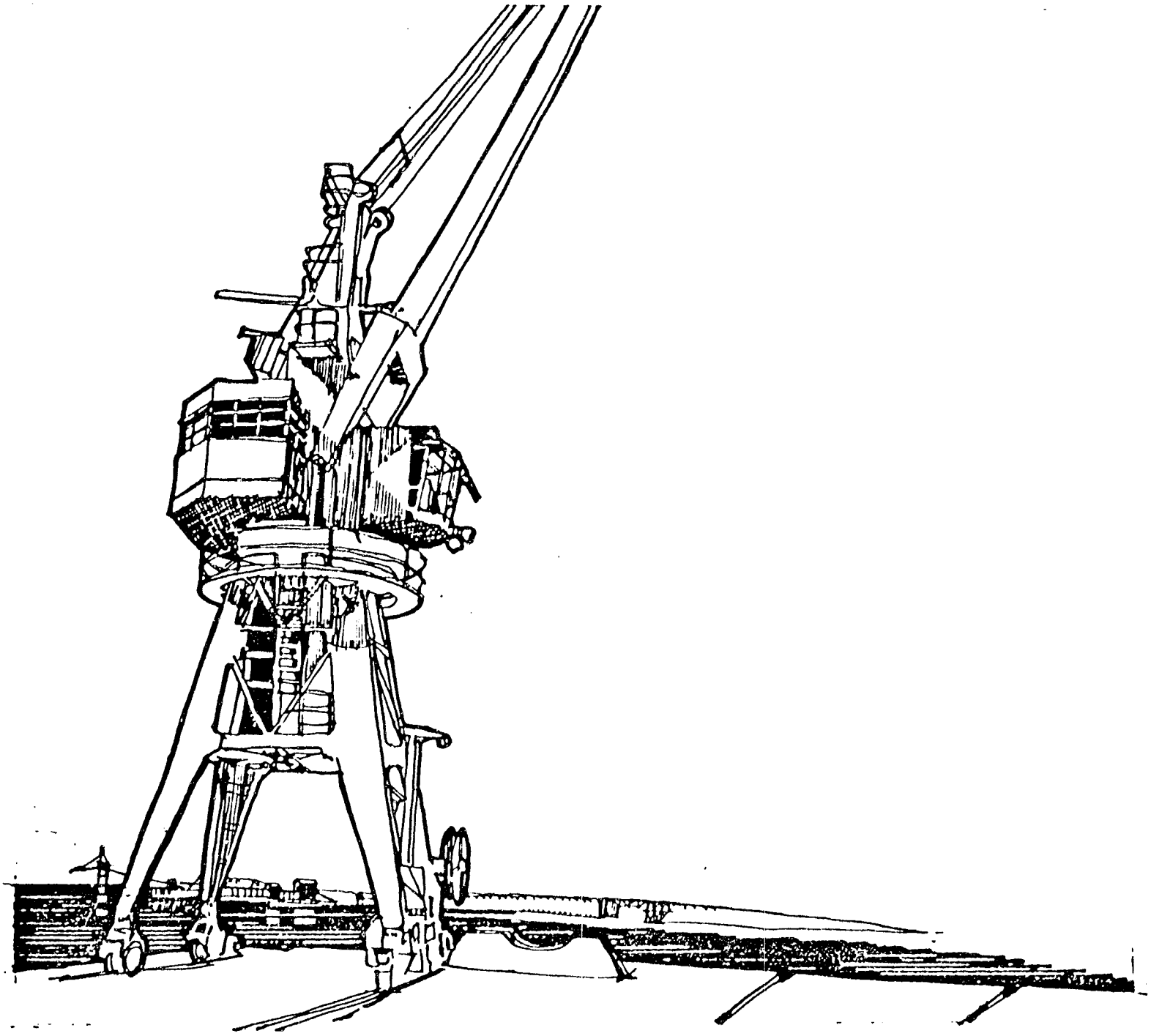
INDUSTRIAL

The warehouse, car maintenance workshop, main plant workshop, car shed and garage are all in an excellent condition and are in use at the moment. The only type of repair needed is the provision and installation of glass for upper windows.

The existing petrol station must be demolished, and a new one should be built in its place.

The ice factory is in a fairly acceptable condition, the east wall must be rebuilt, plastered externaly and painted internaly, a steel door is required for the north facade, internal doors are missing.

One side of the aluminium louvers in the cooling tower should be repaired.



VIEW OF THE CRANE

UTILITIES C2

WATER DISTRIBUTION

The previous main network was either damaged or the land was dug up and the pipes were stolen, thus a complete water distribution network is needed with the exception of ~~a~~ septic tanks most of which are still present and in a reasonable condition except that the iron lids are missing.

FIRE FIGHTING

Provision has to be made for fire fighting, a small fire station should be constructed or part of the garage or warehouses could be converted to one with one small fire engine. Hydrants should be available throughout port areas, hosereels in industrial buildings, all supplied by either town water or emergency sea water pumps.

FUEL DISTRIBUTION

The natural gas supply for the power station and smelter process is anticipated to be available from the Deminex field just offshore from Abu Zeneima. A compressor station and gas-liquid seperation plant will be built within 10 km of the site and pipeline constructed to Abu Zeneima. It is suggested that a network be made to supply the houses with natural gas instead of getting butagas bottles all the way from Suez.

VOID

GARBAGE COLLECTION & GARBAGE DUMPS

Provision has to be made for collecting garbage from houses and other buildings, by car or cart and an appropriate garbage dump area be selected.

The proposed area is in the eastern sector near the warehouse and workshops which is as far away as possible from the residential area, and in an opposite direction to the prevailing wind.

An appropriate system for refuse disposal can be in the use of incineration plants. Another method would be by composting. In this method garbage is first screened to seperate materials for reclamation and reject the other materials which can in turn be burnt.

ROAD NETWORK C3

ROAD NETWORK

The main arterial road in Abu Zeneima that extends from east to west parallel to the coast, is distinguishable, although the asphalt is in a state of disrepair.

The road needs new paving together with side walks and sidewalk trees to provide shade and act as a wind break.

The proposed street layout is a modified grid based on the existing street pattern. A new east west street bounds the northern fringe of existing houses seperating it from the airstrip. (See drawing no 100-C)

The street is stabilised by a line of trees that would seperate road functions from local living functions, besides acting as dust filters and wind breaks and providing welcome shade. South of this is a public park and green area.

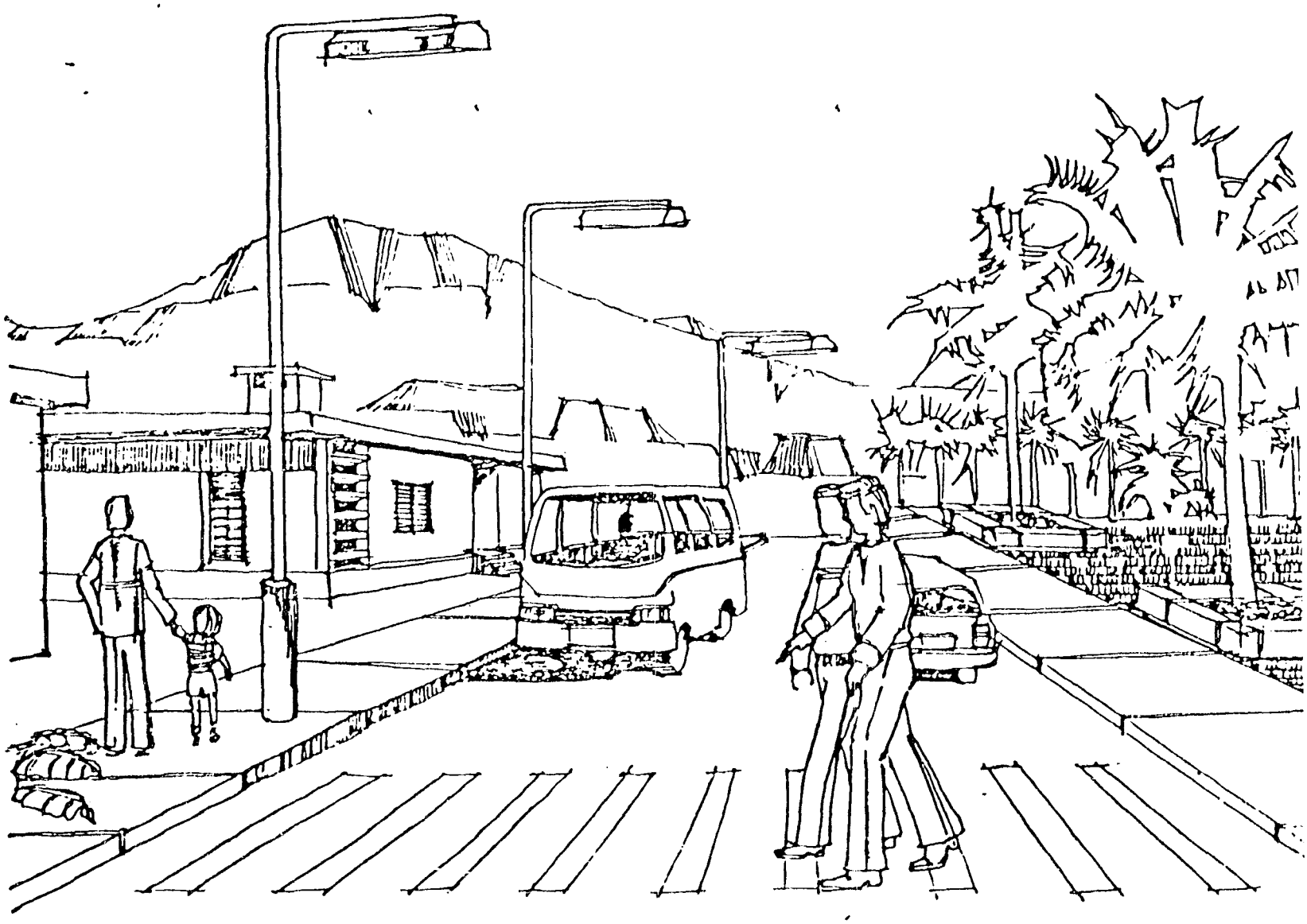
Most of the new housing or future extension is to be north of the existing housing and south of the parks area.

The two arterial streets are to be joined together by a small number of secondry paved roads, perpendicular to the main arterial street.

Besides these, a number of side walks and pedestrian roads are to be provided throughout the residential and commercial zones and penetrating the public green areas.

Since no heavy traffic is expected at Abu Zeneima and due to the smallness of its area it would be advisable to encourage using bicycles as a means of transportation, cyclists would be able to proceed without constant worry from motorist traffic and there would be no need for providing a special cycleway at unnecessary expenses.

Pedestrian roads between houses could remain unpaved at least initially, they would be shaped, compacted and possibly covered with low cost tiles.



VIEW OF MAIN STREET AFTER PLOT RATIONALISATION

LANDSCAPING C4

LANDSCAPE POLICY

Our approach to Landscape policy for Abu Zeneima is both visual and environmental. The provision of greenery ~~with~~ in an arid desert area is important for its softening effect but it should also be designed to satisfy or improve many environmental problems of both climate and microclimate. Particularly important aspects of planting policies of urban development of Abu Zeneima are:

i) Provision of shade, throughout general months of the year in streets, courtyards and public spaces.

ii) Reduction of solar heat radiation and glare, either by the shading of hard surfaces with trees, or the provision of heat absorbent surfaces with low planting.

iii) Wind and dust storm protection, particularly from the khamasin, by the planting of wind breaks and shelter belts, both to reduce wind velocity and to filter dust which the wind carries.

iv) Privacy and enclosure in domestic zones.

v) Amenity planting of public open spaces. (See drawing no. 100-C) ~~See Fig (11)~~

The scale of planting possible, will be directly related to costs both of supply and maintenance. For these reasons it will be disirable that as much plant material as possible is produced by the Governorate Parks and Gardens Department and that the plants chosen should be reletavely maintenance free.

Again on account of expenditure, priorities should be established and it is recommended that these should be as follows:

i) The immediate surroundings of residential development, streets and courtyards.

ii) Public urban open spaces.

iii) Public recreation open spaces which can provide intermediate shelter belts.

iv) Larger scale shelter belt planting.

The establishment of deep shelter belts at the scale of afforestation on the perimeter of the study area is likely to be uneconomic and must remain a subject for ~~bet~~ later study and policy decision, however shelter and wind screening can be acheived through planting which serves other purposes at the same time, for example avenue planting on primary and secondry roads which lie across the direction of the wind. The effectiveness of these plants can be increased if they are underplanted with dense shrubs.

A particular problem of landscaping in Abu Zeneima is the degree of salinity of the soil due to its nearness to the seashore. Nonetheless a small number of trees and shrubs have already succeeded in similar conditons.

The following table in an index of plant material for consideration for landscaping and planting within the study area. Though most of the plants listed are successfully

grown within the Cairo and Suez Canal Region, they have not been planted in Abu Zeneima and it is therefore necessary that preliminary trials should be made, where some doubts exist before any species is extensively specified.

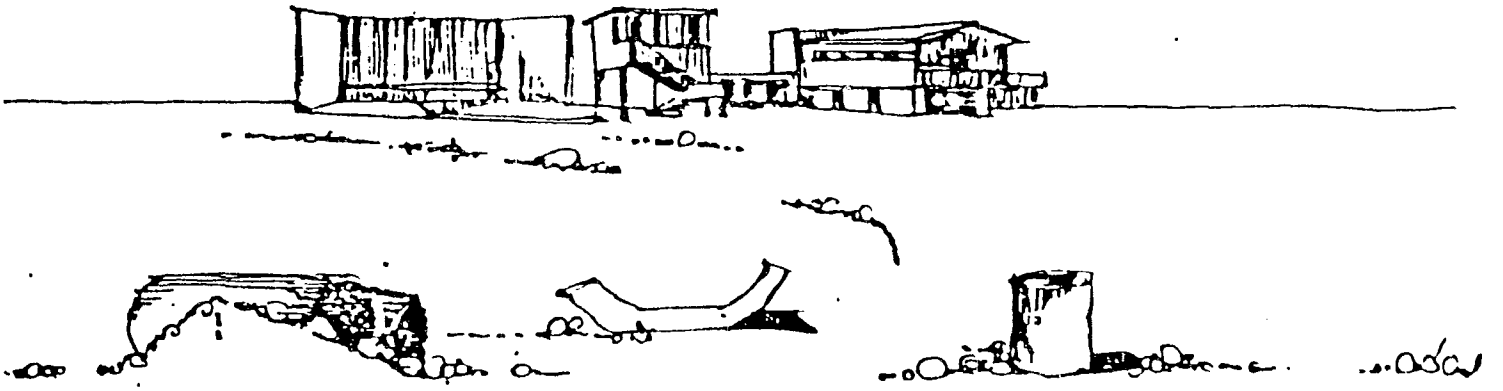
Column references are as follows:

i) R/T Drought resistance/tolerance
ii) S Salinity tolerance
iii) D/E Dissidous/Evergreen
iv) F/M/B Fine, medium or bold texture
v) Flower colour
vi) Height ultimate in meters.

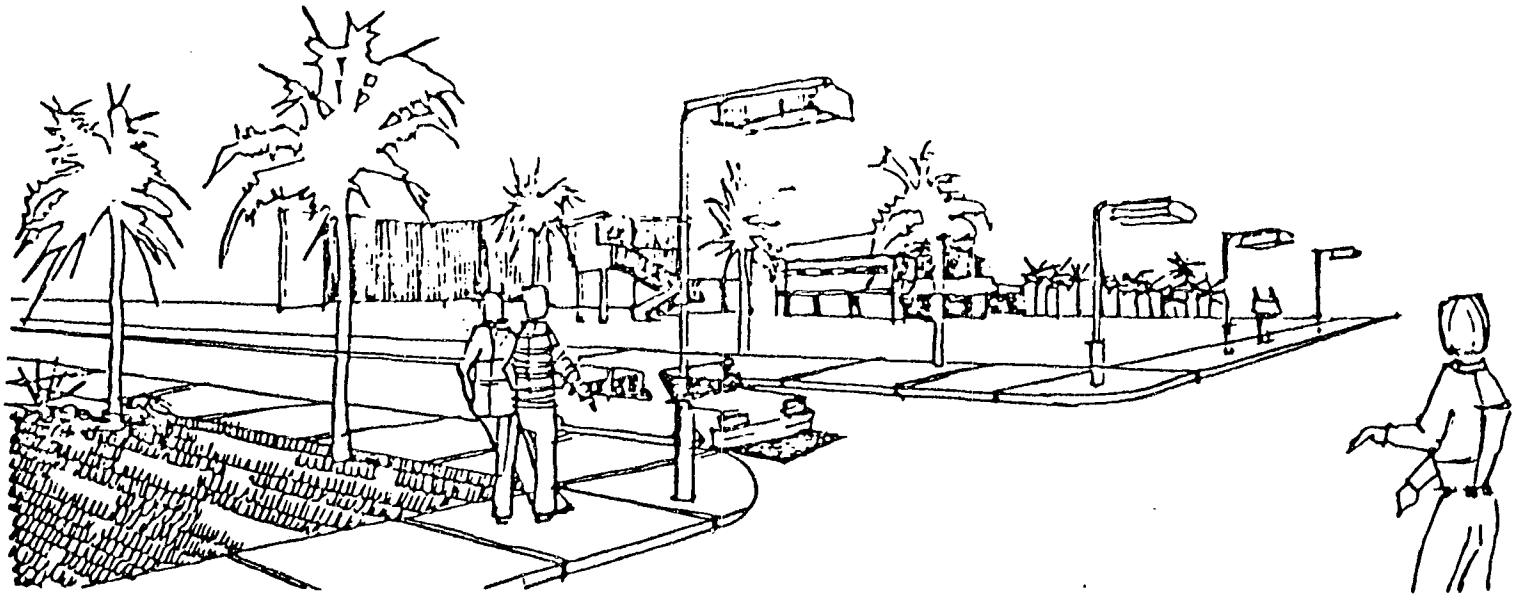
Name	R/T	S	D/E	Texture	Flower Colour	Height	Remarks
Trees Large							
Acacia Nilotica Sant Nile Acacia	R	S	D	F	Yellow	20	Full shade thorny
Casuarina Equisetifolia Gaswarina She Oak	R	S	E	F		30	Useful windbreak. Rapid growth.
Dalbergia Sisoo Sarsou Sisou	T	1/2S	D	M	Yellow	25	Good street tree. Light shade.

Name	R/T	S	D/E	Texture	Flower Colour	Height	Remarks
Eucalyptus Citriodora Kafur limoni Spotted Gum	T	S	E	M	White	20	Rapid growth
Eucalyptus Rostrata Kafur Red Gum	T	S	E	M	Yellow/ green	40	Good shape. Rapid growth with good water table.
Peltophorum Africanum copper rod/ yellow poinciana			E	M	Yellow	20	Golden covering above rounded pinnate leaves good shade tree
Taxodium Distychum Swamp cypress		S	E	F		20	Pyramidal form red trunk
TREES-SMALL							
Acacia Farnesiana Futna Sweet Acacia	T	S	D	F	Yellow	5	Thorny. Fragrant flowers.
Prosopis Juliflora	R	S	E	F	White	6	Fine acacia-like foun bottle bruch flowers.
Pithecellobium Dulce Mardras Thorn	R	S	E	M	Yellow	15	Small leaves in twin pairs. Edible curled pods. Good screen.

Name	R/T	S	D/E	Texture	Flower Colour	Hight	Remarks
Tamarix Articulata Atle Athel Tamarisk	R	S	E	F	Pink	10	Feathery foun. Very salt tolerant.
PALMS Hyphaene Thebacia Doam Today palm	T	S	E	M		10	Branching habit ancient Egyptian palm.
SHRUBS Acacias Spp Sayaal	T	S	D	F	Yellow white	Var-ies	Thorny, fine pinnate leaves Fragrant.
Atriplex Halimus Quataf Salt Bush	T	S		M	White	3	Silvery foliage.
HEDGES Casuarina Equisetifolia. Gaswarina She Oak	R	S	E	F		3+	Clips well to any form. Quick growing.
Pithecalobium Dulce Lawse Hindi Madras Thorn	R	S	E	M	Yellow	3+	Clipped or free growing.
GROUND COVER Poitulaca Grandiflora	T		E	F	Yellow	100 mm	Damp & Sun. Fledry redish stems.
CLIMBERS FLOWERING Luffa Aegyptiaca Lof Loofah	T	S		M	Yellow	4	Annual. Will grow on salt sand.
FOLIAGE PLANTS Ricinus Communis	T	S	E	B	Pink	4	Full sun. Large palmate red green leaves. Glowing red fruits



VIEW OF CINEMA & SPORTING CLUB AT ABU ZENEIMA



VIEW OF CINEMA & SPORTING CLUB FROM MAIN STREET AFTER PLOT RATIONALIZATION

ESTIMATED COSTS

TOWNSITE FACILITIES

This section deals with the estimated costs Both of repairs and construction (At June 1980 prices). It also provides guide lines to further expenditures not mentioned such as consultants and architects fees, contingency and escalation rates. etc..

BASIS OF ESTIMATION

Costs of buildings and infra structure works are based on recent tender levels in Suez and Ismailia Regions with the addition of 20 % to cover the effect of transportation and abnormality of market conditions in Sinai.

Costs of repairs to residential buildings are based on two sources. The first being: A tender Bid for repairing five houses at Om Bogma in 1979 sponsered by Simang.

The second source being a tender Bid by the Arab Contractors for sub contractors to repair a group of Villas and Appartment Buildings in El Tor, Sinai. June 1980. A percentage of 25 % was added as the Estimated profit of the main contractor (the Arab Contractors).

Two other figures were added to cover for transportation from Suez to El Tor, and for differences between original prices and black market prices for cement and reinforcement steel bars.

Element	Description
Roof coverings	Screed, Asphalt, Tiles.
Stair cases	Structure and Balustrades
External Walls and Partitions*	External and internal. Walls
Windows and Doors	Windows including Shutters, Glass wire Mesh, paint etc.
External Finishes	Applied plastering to External surfaces.
Internal Finishes	Applied finishes to walls and ceilings internally.
Flooring	Applied Finishes to floors.
Fittings	Cupboards and closets.
Sanitary, water and rain water disposal installations.	Sanitary fittings and waste pipes, water supply pipes, water tanks, rain water pipes inside or on the external face of a building.
Electrical services	Cables, fittings, appliances on inside or on external face of building.

* Items with asterisk are excluded in cost estimate of repairs.

Another Item not mentioned above is that of demolition and removal of ruins.

Estimates have been based on the use of Materials and forms of construction considered to be economical in Egypt.

The cost estimate was based on items normally included in construction or repair contracts. Unless specifically stated, fittings, furnishings and other equipment are excluded as are machinery. Fees charged by architests, Engineers and other consultants, Central and local Government Administration costs are also excluded.

Other Costs :

Fees charged by Architects, Engineers and other consultant might add between 3 and 7 % to the cost of buildings and infrastructure. Contingency and escalation rate vary between 10-15 %.

BASIS OF EVALUATION :

We list below the elements we have used for estimating the building and repair costs. The list has been chosen after examination of several bills of quantities to ensure that all items needed were readily considered.

Element	Description
Sub Structure*	All foundation work including ground floor slab excluding floor coverings.
Frame, Upper floors and roof structure*	Columns, beams above ground floor slab together with upper floor and roof structure.

ESTIMATED COSTS OF TOWNSITE FACILITIES

:em	No. of Units	Cost of repairs per unit	Sub total	No. of new buildings	Cost estimate per unit	Sub total	Total
HOUSING[1]							
· Type A	15	4,000	60,000	-	-	-	60.000
ii-Type B	21	6,800	142,800	-	-	-	142,800
.i-Type C	40	5,000	200,000	-	-	-	200,000
iv-Type D	11	5,950	65,450	2	32,000	64,000	129,450
- Other	1	7,200	7,200	-	-	-	7,200
Total Housing							539,450
EDUCATION							
·Primary school	-	-	-	1	120,000	120,000	120,000
-Elementary school	-	-	-	1	45,000	45,000	45,000
i-Technical training	-	-	-	1	150,000	150,000	150,000
tal Education							315,000
HEALTH CARE							
·First and center[2]	1	10.000	10,000	1	30,000	30,000	40,000
-Ambulance Service	-	-	-	1	40,000	40,000	40,000
tal Health re							80,000

Item	No. of units	Cost of repairs per unit	Sub total	No. of new building	Cost estimate per unit	Sub total	Total
SOCIAL & RECREATIONAL							
i -Social club	1	15,000	15,000	-	-	-	15,000
ii- Sporting club	1	-	-	-	-	-	-
iii-Cinema[3] & open air Theater.	1	8,000	8,000	-	-	-	8,000
iv- New mosque	-	-	-	1	40,000	40,000	40,000
Sub total social & Recreational							63.000
CIVIL AND ADMINISTRATIVE							
i- Administration building	1	30,000	30,000	-	-	-	30,000
ii- Post office	-	-	-	1	20,000	20,000	20,000
iii- Fire & police station	-	-	-	2	30,000	60,000	60,000
Total Civil and Administrative							110,000
COMMERCE & INDUSTRY							
i- Public restaurant	1	18,000	18,000	-	-	-	18,000
ii- Shopping center	1	20,000	20,000	6 (6 shops)	6,000	36,000	56,000

iii- Ice Factory[4]	1	10,000	10,000	-	-	-	10,000
iv- Ware House & workshops	5	1,500	7,500	-	-	-	7,500
v- Petrol station	1	10,000	10,000	-	-	-	10,000
Sub total Commerce and industry							101,500

1- For Housing Types see Figures 3, 4, 5, 6, & 7.

2- Proposal of adding an emergency ward to the existing first aid centre.

3- No projection equipment is estimated in cost.

4- No equipment or refrigerant is estimated.

PROCESS ALTERNATE 1 - MAJOR EQUIPMENT LIST

A. Materials Handling

1. Crushing and Screening Plant

- o 500 mm X 900 mm Jaw Crusher
- o 900 mm Gyratory crusher
- o 1200 mm X 4300 mm Double Deck Screen

2. Conveyors (complete with Drive and Motors)

a. 600 mm Wide, 8000 mm Long, 2000 mm Lift.
b. 460 mm Wide, 8000 mm Long, 1000 mm Lift.
c. 600 mm Wide, 8200 mm Max. Boom Height, 30,000 mm Slope Length of Boom.
d. 460 mm Wide, 70 m Long
e. Portable 900 mm Wide, 12000 mm Long.

3. Scales

Platform type - 54 T capacity with Data Center for Automatic Weighing.

4. Mobile Equipment

- o Cat 988B Loader
- o Cat 950 Loader
- o Cat D7G Bulldozer
- o Bobcat 731 Loader
- o Forklift Truck V140
- o Forklift Truck V30c
- o Dump Trucks
- o Jib Crane

5. Dust Suppression

Piping, sprays and high pressure pump

6. Product Handling

- o Triple deck screen for FeMn sizing complete with drive and motors.
- o Rehabilitate pig casting machine

7. FeMn Crushing

Denver Jaw Crusher size 250 x 500 mm openings complete with motor.

8. Slag Transporting

Kress carriers for 3.5 m^3 metal ladles and 10 m^3 slag ladles and 9.2 m^3 scrap boxes (max. load 50 T)

B. Submerged Arc Electric Furnace

1. Furnace

- o 13.2 MVA open top submerged arc furnace complete with electrodes.
- o Transformer - three phase 13.2 MVA complete with Copper bus bars for secondary current supply.
- o Tapping, drill and mud gun for opening and plugging tap holes.
- o Tapping launders for metal and slag.

2. Gas Cleaning

- o U-tube coolers - 2200 m^3/min. capacity.
- o Baghouse dust collector - 2200 m^3/min. capacity.
- o Screw conveyors
- o Wetting system for dust suppression.

PROCESS ALTERNATE 2 - MAJOR EQUIPMENT LIST

A. Materials Handling

1. Crushing and Screening Plant

- o 500 mm x 900 mm Jaw Crusher
- o 900 mm Gyratory Crusher
- o 1200 mm x 4300 mm Double Deck Screen

2. Conveyors (complete with drive and motors)

a. 600 mm Wide, 8000 mm Long, 2000 mm Lift.
b. 460 mm Wide, 8000 mm Long, 1000 mm Lift.
c. 600 mm Wide, 8200 mm Max. Boom Height, 30,000 mm slope length of boom.
d. 460 mm Wide 70 m Long.
e. Portable 900 mm Wide, 12000 mm long.

3. Scales

Platform type -54 T capacity with Data Center for automatic weighing.

4. Mobile Equipment

- o Cat 988B Loader
- o Cat 950 Loader
- o Cat D7G Bulldozer
- o Bobcat 731 Loader
- o Forklift Truck V140
- o Forklift Truck V30c
- o Dump trucks
- o Jib Crane

5. Dust Suppression

Piping, sprays and high pressure pump

6. Product Handling

- o Triple deck screen for FeMn sizing complete with Drive and motors.
- o Rehabilitate Pig casting machine

7. FeMn Crushing

Denver Jaw Crusher size 250x500 mm openings complete with motor.

8. Slag Transporting

Kress carriers for 3.5 m^3 metal ladles and 10 m^3 slag ladles and 9.2 m^3 scrap boxes (max. load 50 T)

B. Submerged Arc Electric Furnace

1. Furnace

- o 2 x 13.2 MVA open top submerged arc furnaces complete with electrodes.
- o 2 transformers - three phase 13.2 MVA complete with copper bus bars for secondary current supply.
- o Tapping drills and mud guns for opening and plugging tap holes.
- o Tapping launders for metal and slag.

2. Gas Cleaning

- o U-tube coolers - 2200 m^3/min Capacity
- o Baghouse dust collectors - 2200 m^3/ min. capacity
- o Screw conveyors
- o Wetting Systems for dust suppression

PROCESS ALTERNATE 3 - MAJOR EQUIPMENT LIST

A. Materials Handling

1. Crushing and Screening Plant

- o 500 mm x 900 mm Jaw Crusher
- o 900 mm Gyratory crusher
- o 1200 mm x 4300 mm Double Deck screen

2. Conveyors (complete with drive and motors)

a. 600 mm Wide, 8000 mm Long, 2000 mm Lift
b. 460 mm Wide, 8000 mm Long, 1000 mm Lift.
c. 600 mm Wide, 8200 mm Max. Boom height, 30,000 Slope length of Boom.
d. 460 mm Wide, 90 m. Long
e. Portable 900 mm Wide, 12000 mm long.

3. Scales

Platform type - 54 T capacity with Data Center for Automatic weighing.

4. Mobile Equipment

- o Cat 988B Loader
- o Cat 950 Loader
- o Cat D7G Bulldozer
- o Bobcat 731 Loader
- o Forklift Truck V140
- o Forklift truck V30c
- o Dump trucks
- o Jib crane

5. Dust Suppression

Piping, sprays and high pressure pump.

6. Product Handling

- o Triple deck screen for FeMn sizing complete with drive and motors.
- o Rehabilitate pig casting machine

7. FeMn Crushing

Denver Jaw Crusher size 250 x 500 mm openings complete with motor.

8. Slag Transporting

Kress carriers for 3.5 m^3 metal ladles and 10 m^3 slag ladles and 9.2 m^3 scrap boxes (max. load 50 T)

B. Preheat Kiln

Rotary Kiln complete with drives, firing hood, retractable gas burner, offgas cyclones, baghouse dust collector, exhaust stack, dust conveyors and cooling water system.

C. Submerged Arc Electric Furnace

1. Furnace

- o 13.2 MVA closed top submerged arc furnace complete with electrodes.
- o Transformer - three phase 13.2 MVA complete with copper bus bars for secondary current supply.
- o Tapping, drill and mud gun for opening and plugging tap holes.
- o Tapping launders for metal and slag.

2. Gas Cleaning

- o Wet type dust collector - 2200 m^3/min. capacity.
- o 4.6 m diameter thickener complete with slurry pumps and overflow pumps.

PROCESS ALTERNATE 4 - MAJOR EQUIPMENT LIST

A. Materials Handling

1. Crushing and Screening Plant

- o 500 mm x 900 mm Jaw Crusher
- o 900 mm Gyratory Crusher
- o 1200 mm x 4300 mm Double Deck screen

2. Conveyors (complete with drive and motors)

a. 600 mm Wide, 8000 mm Long, 2000 mm Lift.
b. 460 mm Wide, 8000 mm Long, 1000 mm Lift.
c. 600 mm Wide, 8200 mm Max. Boom Height, 30,000 mm Slope Length of boom.
d. 460 mm Wide, 70 m Long
3. Portable 900 mm WIDE, 12000 mm Long.

3. Scales

Platform type - 54 T capacity with Data Center for automatic weighing.

4. Mobile Equipment

- o Cat 988B Loader
- o Cat 950 Loader
- o Cat D7G Bulldozer
- o Bobcat 731 Loader
- o Forklift Truck V140
- o Forklift truck V30c
- o Dump trucks
- o Jib Crane

5. Dust Suppression

Piping, sprays and high pressure pump.

6. Product Handling

- o Triple deck screen for FeMn sizing, complete with drive and motors.
- o Rehabilitate pig casting machine.

7. FeMn Crushing

Denver Jaw Crusher size 250 x 500 mm openings complete with motor.

8. Slag Transporting

Kress carriers for 3.5 m^3 metal ladles and 10 m^3 slag ladles and 9.2 m^3 scrap boxes (max. load 50 T.)

B. Reduction Kiln

3 m diameter by 50 m long, rotary kiln, complete with drives, shell-air/natural gas tuyures with fans and piping, firing hood, retractable gas burner, offgas cyclones, baghouse dust collector, exhaust stack, dust conveyors and cooling water system.

Indirect rotary product cooler 2.5 m diameter by 40 m long with partial refractory lining.

C. Open Arc Electric Furnace

1. Furnace

- o 13.2 MVA tilting open arc furnace with prebaked electrodes.
- o Transformer - three phase 13.2 MVA complete with copper bus bars for secondary current supply.

2. Gas Cleaning

- o U-tube coolers - 2200 m^3/min capacity
- o Baghouse dust collector - 2200 m^3/min capacity
- o Screw conveyors
- o Wetting system for dust suppression.

D. Submerged Arc Electric Furnace

1. Furnace

- o 13.2 MVA open top submerged arc furnace complete with electrodes.

- Transformer - three phase 13.2 MVA complete with copper bus bars for secondary current supply.
- Tapping, drill and mud gun for opening and plugging tap holes.
- Tapping launders for metal and slag.

2. Gas Cleaning

- U-tube coolers - 2200 m^3/min. capacity
- Baghouse dust collector - 2200 m^3/min. capacity
- Screw conveyors
- Wetting system for dust suppression.

APPENDIX 8

(Section 6.12)

Commercial and Financial Analysis

TABLE OF CONTENTS

- Ferromanganese Smelter Overview Report - Satra Corporation
- Commercial Analysis - Documentation
- Estimate Criteria - Types I and II
- Capital Cost Estimates - Details
- Price Quotations
- Equipment Replacement Schedule - Details
- Operating Cost Estimates - Details
- Development of Energy Costs
- Process Plant Production Schedule

MACALLOY CORPORATION
1211 AVENUE OF THE AMERICAS • NEW YORK, N.Y. 10036 • (212) 944-0050/0051

RECEIVED
SEP 8 1980
Kaiser Engineers, Inc.
R. D. Greenwalt

August 25, 1980

Mr. Richard Greenwalt
Kaiser Engineers
300 Lakeside Drive
P. O. Box 23210
Oakland, Calif. 94623

Dear Dick:

Please find attached the information requested in the outline that you sent me. It's in draft form in order to keep everything in motion.

John advised that you would have your people type the material and send me a copy, as there will be nothing for our file, since you will have the only draft.

Very truly yours,

J. Winterhaler

J. Winterhaler

JW:al
Encl.

FERROMANGANESE SMELTER OVERVIEW

by

Satra Corporation

for

KAISER ENGINEERS

FERROMANGANESE SMELTER OVERVIEW BY

SATRA CORPORATION

A. General Review of Ferroalloys Industry - Manganese

1. Major Producers

Manganese is the most widely used alloying agent in modern steel production. The quantity of manganese in one form or another, calculated as pure manganese, is 5 to 9 Kilograms per ton of raw steel produced. By far, the ferroalloy used is High-Carbon Ferromanganese (Standard Ferromanganese) with 72 to 80 percent manganese and 6 to 7 percent carbon. In view of the above, many countries throughout the world produce manganese, normally in the form of high-carbon ferromanganese, usually to protect their steel industries, and in many instances for export.

The major producers of high-carbon ferromanganese in the world are in TABLE I.

2. Smelter Locations

The principal smelter locations of certain of the major producers of high-carbon ferromanganese are shown in TABLE II.

3. Manganese Ore Locations

Although, at current prices, there are no domestic reserves of manganese ore containing 35 percent or more of manganese, there are practically unlimited reserves of manganese scattered throughout the world. The United States Bureau of Mines identifies 2 billion tons of contained manganese, excluding sea-floor deposits, which in terms of manganese ore amounts to some 6 billion tons that can be mined with current technology.

The manganese ore producers of the world are distributed throughout the tropical, sub-tropical and warmer temperate zones among approximately 30 countries. In addition to the U.S.S.R. and mainland China, the principal manga-

3. Manganese Ore Locations (Cont'd)

nese ore producers are the following:

Australia -	Groote Eylandt Mining Co.
Brazil -	Industria e Comercio de Minerios S.A. (ICOMI)
Gabon -	Cie. Miniere de L'Ogooue (COMILOG)
Ghana -	Formerly African Manganese Ltd; now Ghana National Manganese Corp.
India -	Formerly Central Provinces Manganese Ore Co.; now Manganese Ore India Ltd. (MOIL)
Mexico -	Cia. Minera Autlan
Morocco -	Soc. Anonyme Cherifienne d'Etudes Minieres (SACEM)
Republic of South Africa -	South African Manganese Amcor Ltd. (SAMANCOR)
	Associated Manganese Mines of South Africa, Ltd.

In TABLE III is shown the world production of manganese ore by country for 1976, 1977, and 1978. I would not expect much variation from these for 1979 and 1980.

4. High-Carbon Ferromanganese Production

The world production of high-carbon ferromanganese by country for the years 1975, 1976, 1977 and 1978 is shown in TABLE IV. Data for the years 1979 and 1980 should be quite similar. The listing is not complete as some countries failed to break down their production by individual product.

5. Steel Production

The world output of raw steel by country for 1976, 1977, and 1978 is shown in TABLE V. The patterns for 1979 and 1980 should be similar to those of the previous years shown.

6. Anticipated Trends

The current trend is toward the use of the electric furnace for the production of ferromanganese rather than the blast furnace which at one time was popular in England, France, Germany and the United States. At the present time only in France is the blast furnace in use for this purpose. The blast furnace requires much more coke per unit of manganese produced than

6. Anticipated Trends (Cont'd)

does the electric furnace. With the recent escalation in the price of metallurgical coke, as well as its short supply, the switch to the use of the electric furnace for the manufacture of ferromanganese is almost complete. The electric furnace is much more flexible than the blast furnace in that manganese bearing slags can be reprocessed to produce silicomanganese, and then to medium or low-carbon ferromanganese or even to manganese metal.

In the manufacture of ferromanganese, it is possible to produce a slag low enough in manganese to discard it; however, the overall recovery of manganese is higher, if a manganese bearing slag is first produced and subsequently utilized in the manufacture of other alloys of manganese, mainly silicomanganese. Furnaces of the same design are used for smelting silicomanganese as are used for ferromanganese. At one time it was thought that the consumption of silicomanganese would decrease as the BOF replaced the Open Hearth for the manufacture of carbon steel. This has not been proven to be the case. Below are shown data with reference to the consumption of ferromanganese and silicomanganese for both Japan and the United States:

Japan - In Metric Tons

	FeMn	SiMn
1974	448,000	401,000
1975	375,000	379,000
1976	369,000	371,000
1977	364,000	346,000
1978	383,000	337,000

United States - In Net Tons

	FeMn	SiMn
1974	956,000	177,000
1975	748,000	161,000
1976	756,000	155,000
1977	748,000	148,000
1978	832,000	164,000
1979	819,000	157,000

The consumption of energy is not as important in the manufacture of ferromanganese as it is in the manufacture of most other alloys, since the quantity of energy per unit of alloy is rather low when compared to other alloys. This is an important consideration in view of the rapid rise in the cost of energy during the past five years; this element of cost is more likely than

6. Anticipated Trends (Cont'd)

not to continue to rise in the years ahead.

In the past, the furnaces of the manganese alloy producers in the United States have been serious polluters of the atmosphere near the manufacturing plants. However, the industry has made, and is continuing to make large capital expenditures for pollution control; also, the operation of the equipment after installation is an appreciable cost item. A set of air pollution control regulations for new ferroalloy production facilities, applicable to installations whose construction or modification began after October 21, 1974, was published in May 1976 by the U.S. Environmental Protection Agency (EPA). These regulations limit particulate emission from electric furnaces producing manganese alloys to less than 0.51 pounds per megawatt-hour. National water pollution control regulations have been established by the EPA for electric furnace production of manganese alloys. The regulation specifies two levels of control: One corresponding to application of best practical technology by July 1977, and the other to application of best available technology by July 1983.

The alloy producers of developed countries are presently being faced with similar standards for pollution as those of the United States. It is likely that the alloy producers of undeveloped countries will be called upon to meet essentially the same standards in the future.

B. Power Cost Data

1. Typical Power Contract

A power contract typical to the ferroalloys industry is included as Attachment "A".

2. Power Costs - Major Countries

Previously submitted.

C. Advantages/Disadvantages of Abu Zeneima vs Other International Sites

When comparing the advantages and/or disadvantages of Abu Zeneima with other International sites, one of the principal elements for consideration is the availability and cost of energy. With the present world energy situation, it is quite clear that the cost of energy throughout the world should not vary significantly. This makes it imperative that the policies and regulations of the Egyptian Government with reference to energy be realistic, that is make it readily available and competitive cost-wise, in order to allow its ferroalloy industry first to exist then to grow.

Another important consideration is the quality, availability, and cost of the raw materials required for the production of ferromanganese, mainly manganese ore and coke. With reference to manganese ore, Abu Zeneima is fortunate in that the deposit of manganese ore is quite close to the alloy producing facility. This is unusual in that in most parts of the world, the manganese mines are hundreds or even thousands of miles from the alloy producing facilities. This is particularly true of Japan, France, Norway, and the United States, major manganese alloy producers of the Western World. It must be recognized, however, that the Egyptian manganese ore is of lower quality than those of the principal manganese ore suppliers of the world, mainly Australia, Brazil, Gabon, India, and South Africa.

The availability and cost of coke for producing ferromanganese in Egypt should be no more or no less of a problem than it is to most of the alloy producers of the free world with possibly the exception of the United States where coke of good quality appears to be somewhat underprice. Since coke is simply another form of energy, it is expected in the long run that its cost will be pretty much the same throughout the free world.

The availability and quality of labor are important considerations in the establishment and operation of a modern ferroalloy manufacturing facility. Although the number of people available in the area of Abu Zeneima, and especially in Egypt, is more than sufficient to staff the plant under consideration, the qualifications of these people are problbly not as high as those of the principal alloy producers of the free world with possibly the exception of India, Mexico and South Africa. This lack of qualification is not a severe handicap, as the manufacture of ferromanganese is not a complex process but rather a straight forward one of a repetitive nature permitting proper training of people with little or no formal education. This has proven to be the case for the black population of South Africa.

C. Advantages/Disadvantages of Abu Zeneima vs Other International Sites

The basic process for the manufacture of ferromanganese recommended for Abu Zeneima is well known. The process or a variation of it is used by virtually all the producers of ferromanganese in the world. The technology for the production of ferromanganese, as well as silicomanganese, in an electric furnace is well established. It is unlikely that new technology will replace present technology in the foreseeable future.

D. Product Marketing

1. Product Quality Standards

	United States - ASTM Standard Ferromanganese		
	Grade A	Grade B	Grade C
Mn	78.0-82.0	76.0-78.0	74.0-76.0
C (Max.)	7.5	7.5	7.5
Si (Max.)	1.2	1.2	1.2
P (Max.)	0.35	0.35	0.35
S (Max.)	0.050	0.050	0.050

	Silicomanganese		
	Grade A	Grade B	Grade C
Mn	65.0-68.0	65.0-68.0	65.0-68.0
C (Max.)	1.5	2.0	3.0
Si	18.5-21.0	16.0-18.5	12.5-16.0
P (Max.)	0.20	0.20	0.20
S (Max.)	0.04	0.04	0.04

The marketing and distribution of the materials produced do not appear to present problems in view of the forecasted manufacturing program which is as follows:

Ferromanganese

Greater Cairo Area	12,000
Alexandria	1,000
Export	7,000
Total - TPY	20,000

Pig Iron

Greater Cairo Area	27,000
Alexandria	27,000
Export	-
Total - TPY	54,000

D. 1. Product Quality Standards (Cont'd)

It is most likely that the ferromanganese for export would be sold in Europe where the market for ferromanganese is in excess of one million tons per year. The quantity forecasted for export from Egypt represents less than one percent of this quantity. There are numerous brokers in Europe who would be in a position to move ferromanganese, as well as any silicomanganese that might be produced, into the market place for the Egyptians.

TABLE I

MAJOR PRODUCERS OF HIGH-CARBON FERROMANGANESE

Argentina	Japan
Australia	Korea, Republic of
Belgium	Mexico
Brazil	Norway
Canada	Poland
China	South Africa, Republic of
Czechoslovakia	Spain
France	USSR
Germany, Federal Rep.	United Kingdom
India	United States
Italy	Yugoslavia

TABLE II

SMELTER LOCATIONS OF MAJOR PRODUCERS OF HIGH-CARBON FERROMANGANESE

Australia

Tasmanian Electrometallurgical Co., Ltd. (TEMCO), Bell Bay, Tasmania.

Brazil

Eletrosidelurgica Brasileira S.A. (SIBRA), Bahia.

Canada

Union Carbide Corp. of Canada, Beauharnois, Ontario, Canada.

France

Acieries de Paris ET D'Outreau, France.

India

Ferro Alloys Corporation Ltd. (FACOR), Garividi, Andhra Pradesh.

Jeypore Sugar Co. Ltd., Rayagada, Orissa.

Khandelwal Ferro Alloys Ltd., Nagpur, Maharashtra.

The Tata Iron & Steel Co. Ltd., Joda, Keonjhar District.

Universal Ferro & Allied Chemicals, Ltd., Tumsar, Masharashtra.

Japan

Chuo Denki Kogyo Co., Ltd., Kashima Plant.

Japan Metals & Chemicals Co., Ltd., Nomachi Plant.

Japan Metals & Chemicals Co., Ltd., Sakata Plant.

Kobe Steel Ltd., Kakogawa Plant.

Mizushima Ferro Alloy Co. Ltd., Mizushima Plant.

Nippon Denko KK, Tokushima Plant.

Nippon Kokan KK, Niigata Plant.

Pacific Metals Co. Ltd., Hachinoe.

TABLE II (Cont'd)

Mexico

Compania Minera Hutlan S.A. de C.V., Tamos, Mexico.

Norway

Elchem A/S, Porsgrunn Elektrometallurgiske (PEA), Porsgrunn Plant.

Electric Furnace Products Co. (Union Carbide Corp.), Sauda Plant.

Tinfos Jernverk A/S, Notodden Plant.

Republic of South Africa

Feralloys Ltd., Cato Ridge, Natal.

Samancor, Kookfontein, Transvaal.

United States

Ohio Ferro-Alloy Corp., Philo, Ohio, Philo Plant.

Samancor (Formerly Roane Electric Furnace Co.).

SKW (Formerly Airco Inc.)

Union Carbide Corp. - Marietta, Ohio, Marietta Plant.

TABLE III

MANGANESE ORE: WORLD PRODUCTION, BY COUNTRY

Country	Percent Mn	Thousand Metric Tons 1976	1977	1978
North America				
Mexico	35+	453	487	523
South America				
Argentina	25-35	53	82	91
Brazil	38-50	1,696	1,516	990
Europe				
Bulgaria	30	40	40	40
Hungary	18-20	165	161	156
U.S.S.R.	35	8,636	8,595	8,600
Yugoslavia	30+	19	35	32
Africa				
Gabon	50-53	2,217	1,851	1,710
Ghana	30-50	384	343	321
Morocco	50-53	117	114	100
South Africa, Republic of	30-48+	5,452	5,048	4,317
Zaire	30-57	182	41	-
Asia				
China, Mainland	30+	1,000	1,000	1,000
India	10-54	1,738	1,940	1,567
Iran	33+	40	40	30
Japan	26-28	142	126	107
Thailand	46-50	50	77	72
Turkey	35-46	34	35	56
Oceania				
Australia	37-53	2,154	1,387	1,290
New Hebrides	40-44	35	25	22
Others	-	-	-	-
TOTAL		24,000	23,000	21,000

TABLE IV

FERROMANGANESE: WORLD PRODUCTION

Country	1975	1976	1977	1978
Argentina	29,337	23,743	28,665	24,000
Australia	38,784	49,927	71,012	72,000
Belgium	98,000	84,000	55,000	87,000
Brazil	86,850	98,738	128,922	135,000
Canada	56,000	56,000	84,000	92,000
Chile	6,082	8,301	4,267	4,000
China	210,000	210,000	240,000	310,000
France	420,000	365,000	358,000	390,000
Germany, Fed.Rep.of	210,000	220,000	175,000	209,000
Hungary	2,700	2,400	2,400	2,500
India	142,549	175,553	166,857	219,517
Italy	71,466	78,459	75,160	89,929
Japan	649,834	632,160	527,418	455,729
Korea, Rep. of	-	-	25,550	46,200
Mexico	64,705	54,418	99,304	125,000
Norway	338,801	375,196	244,335	276,385
Poland	139,000	116,000	123,000	119,000
South Africa,Rep.of	337,000	350,000	400,000	480,000
Spain	126,613	132,696	148,130	138,346
USSR	958,000	940,000	945,000	980,000
United Kingdom	85,000	122,000	97,000	69,000
United States	522,365	437,864	303,121	247,235
Yugoslavia	30,674	22,211	54,639	75,000
TOTAL	4,623,760	4,554,671	4,356,780	4,646,841

TABLE V

RAW STEEL

World

Raw Steel: 1/ World Production, by Country

(Thousand metric tons)

Country	1975	1976	1977 p/
North and Central America:			
Canada	13,025	13,326	13,631
Cuba e/	r/298	250	300
El Salvador	11	e/11	13
Mexico	5,272	5,298	5,545
United States 2/	105,816	116,120	113,700
South America:			
Argentina	2,268	2,410	2,676
Brazil	8,308	9,169	11,052
Chile	488	482	548
Colombia	370	360	326
Peru	432	349	379
Uruguay	16	15	17
Venezuela	1,075	937	855
Europe:			
Austria	4,068	4,477	4,092
Belgium	11,587	12,149	11,257
Bulgaria	2,265	2,460	e/2,590
Czechoslovakia	14,323	14,693	e/15,091
Denmark	559	722	686
Finland	1,618	1,644	2,196
France	21,530	23,221	22,090
German Democratic Republic	6,472	6,732	6,850
Germany, Federal Republic of	40,415	42,415	38,985
Greece	r/721	r/e/450	450
Hungary	3,673	3,652	e/3,650
Ireland	81	[illegible]	48
Italy	21,836	23,447	23,334
Luxembourg	4,624	4,566	4,329
Netherlands	r/4,826	5,186	4,927
Norway	907	898	733
Poland	15,007	15,640	17,844
Portugal	419	463	536
Romania	9,549	10,733	11,600
Spain	r/11,137	10,910	e/10,856
Sweden	5,611	5,140	e/3,793

Cont'd...

Raw Steel: 1/ World Production, by Country (Cont'd)

(Thousand metric tons)

Country	1975	1976	1977 p/
Europe: (Cont'd)			
Switzerland	420	545	e/700
USSR	141,325	144,805	147,000
United Kingdom	20,198	22,274	e/21,176
Yugoslavia	2,917	2,751	3,814
Africa:			
Algeria	r/221	356	400
Angola	41	38	e/40
Egypt	348	457	263
Ghana e/	15	15	15
Kenya e/	-	10	10
Libya e/	10	10	10
Morocco e/	r/6	r/6	6
Mozambique e/	38	40	40
Nigeria e/	14	15	15
Rhodesia, Southern e/	300	300	300
South Africa, Republic of	6,499	7,083	e/7,309
Tunisia	129	103	156
Uganda	15	r/15	e/15
Zaire e/	-	30	30
Asia:			
Bangladesh	97	82	116
Burma e/	r/36	40	40
China, People's Republic of e/	r/25,000	r/25,000	27,000
Hong Kong e/	r/69	70	70
India	r/7,991	9,364	9,921
Indonesia	100	100	e/100
Iran	551	549	e/550
Iraq e/	210	200	200
Israel e/	r/57	r/80	100
Japan	102,313	107,399	102,405
Jordan e/	182	200	200
Korea:			
North	r/2,840	3,000	3,100
Republic of	2,010	2,698	2,737
Lebanon e/	15	r/8	8
Malaysia	195	200	e/200
Philippines e/	r/280	r/300	300
Saudi Arabia e/	160	160	160
Singapore	r/187	200	e/200
Syria e/	135	150	150
Taiwan	520	597	644

Cont'd...

TABLE V (Cont'd)

Raw Steel: 1/ World Production, by Country (Cont'd)

(Thousand metric tons)

Country	1975	1976	1977 p/
Asia: (Cont'd)			
Thailand	r/258	280	e/300
Turkey	I,457	1,457	I,397
Vietnam	4	4	5
Oceania:			
Australia	7,843	7,774	7,313
New Zealand	185	214	e/200
Total	r/643,798	677,362	673,694

e/ Estimate. p/ Preliminary. r/ Revised.
I/ Steel formed in first solid state after melting, suitable for further processing or sale; for some countries, includes material reported as "liquid steel," presumably measured in the molten state prior to cooling in any specific form.
2/ Data from American Iron and Steel Institute (AISI). Excludes steel produced by foundries not reporting output to AISI but reported to Bureau of the Census as follows, in thousand metric tons: 1975--1,757; 1976--1,637; 1977--1,414.

From Mineral Trade Notes, Vol.75, No.9, September 1978.

ATTACHMENT "A"

This Agreement entered into this 14TH day of MAY, 1979,

by and between the OHIO POWER COMPANY, hereafter called the Company, and

SATRALLOY, INC., 625 STANWIX STREET, PITTSBURGH, PENNSYLVANIA 15222,

or his or its heirs, successors or assigns, hereafter called the Customer,

Witnesseth:

For and in consideration of the mutual covenants and agreements hereinafter contained, the parties hereto agree with each other as follows:

The Company agrees to furnish to the Customer during the term of this Agreement, and the Customer agrees to take from the Company, subject to Company's standard Terms and Conditions of Service as regularly filed with the Public Utilities Commission of Ohio, all the electric energy of the character specified hereto that shall be purchased by the Customer in the premises located at GOULDS ROAD (JEFFERSON COUNTY ROAD 74), MINGO JUNCTION, OHIO 43938.

The Company is to furnish and the Customer is to take electric energy under the terms of this Agreement for a period of TWO years from the time such service is commenced, and thereafter in successive periods of not less than ONE year each, until either party shall give the other not less than 1 YEARS' notice in writing of his or its election to discontinue the service at the expiration of any of said periods. The date that service shall be deemed to have commenced under this Agreement shall be MAY 22, 1979

The electric energy delivered hereunder shall be alternating current at approximately 138,000 volts 3 wire single phase three and it shall be delivered at COMPANY'S 138 KV STRUCTURE LOCATED IN TIDD SWITCHING STATION, SEE SKETCH ON REVERSE SIDE,

which shall constitute the point of delivery under this Agreement. The said electric energy shall be delivered at reasonably close maintenance to constant potential and frequency and it shall be measured by a meter or meters owned and installed by the Company and located IN COMPANY'S TIDD SWITCHING STATION, SEE SKETCH ON REVERSE SIDE.
METERED: 138,000 VOLTS, 4 WIRE, 3 PHASE, DELTA

The reservation of capacity contracted for by Customer under the tariff named herein is hereby fixed at 50,000 kw

The Customer hereby agrees to pay the Company monthly for electric energy delivered hereunder at the rate and under the provisions of Company's Tariff I.R.P. as regularly filed with the Public Utilities Commission of Ohio, said tariff being selected by the Customer, as long as said tariff is in effect and in the event said tariff is replaced by a new or revised tariff incorporating higher or lower rates than those stipulated in the aforementioned tariff, the Company will continue to furnish service as stipulated in the Agreement and the Customer will pay for such service at the higher or lower rates from and after the date when such rates are made effective.

There are no unwritten understandings or agreements relating to the service hereinabove provided.

This Agreement cancels and supersedes all previous agreements relating to the purchase by Customer and sale by Company of electric energy at Customer's premises as referred to above.

This Agreement shall be in full force and effect when signed by the authorized representatives of the parties hereto.

OHIO POWER COMPANY

By C. V. Wright

Title DIVISION MANAGER

SATRALLOY, INC.

By [illegible]

Title TREASURER

TARIFF I.R.P.

(Interruptible Power)

AVAILABILITY OF SERVICE

Available to industries located in the company's operating area in the State of Ohio in the immediate vicinity of the company's generating stations, delivery to be made at the point or points designated by the company where line or lines provided by the customer connect with delivery facilities located at or near any of said stations. Service will be made available to such industries in accordance with the provisions set forth below.

CONTRACT CAPACITY

The company will be the sole judge as to the amount of capacity which it makes available for interruptible power service from each of the company's generating stations and from the company as a whole. The customer will contract for capacity sufficient to meet normal maximum requirements, but in no event will the amount contracted for be less than 20,000 kilowatts nor more than 160,000 kilowatts at any delivery point. The company will not be required to supply capacity in excess of that contracted for except by mutual agreement. If in the absence of such agreement the customer's demand exceeds the contract capacity, the company will promptly notify the customer to reduce demand and will interrupt the service if such reduction is not accomplished.

CONDITIONS OF DELIVERY OF SERVICE

Energy will be delivered hereunder to the customer only when the company has spinning reserve capacity in its system and during such hours as the company may determine. Switching facilities provided by the company will be at all times under the control of the company's personnel at the generating station where service is delivered.

The customer shall, to the extent practicable, advise the company of planned curtailments of his capacity requirements. The company will endeavor to give the customer as much advance notice as possible of the interruptions or curtailments of service hereunder, but it reserves the right to interrupt the customer's service without notice in the event of emergency or in the event that in the company's judgment the operation of the company's system requires an interruption of the customer's service. The company will endeavor to make available the full capacity requirements of the customer within the limits of the contract for at least 132 hours during each calendar week and for at least 572 hours during each monthly billing period. However, in the event the company does not make such capacity available to the customer for such specified hours, the liability of the company shall be limited to the reduction of the demand charge as provided in the paragraph "Adjustment of Demand Charge."

The customer may at his option provide auxiliary switching in his plant for the purpose of subdividing the interruptible load so that, if the company requests a reduction in load rather than a complete interruption, such reduction may be accomplished by the customer when the company so requests. In the event the customer requires power service which is not subject to interruptions as provided for under this tariff, such service will be separately supplied and metered under the provisions of a tariff applicable to the type of service which the customer requires.

In the event that customer desires firm power service for his total load, he will have the privilege of contracting for it under the terms of the appropriate firm power tariff. In the event that company is ordered by a Government agency having authority during a period of national emergency to supply firm power instead of interruptible power and customer is unwilling to sign a contract for the minimum period specified in the applicable firm power tariff, service will be supplied under this tariff with appropriate adjustment in the charges to cover the company's cost of providing firm power service, but the total charges shall not be less than those computed under the applicable firm power tariff.

DELIVERY VOLTAGE

Service hereunder will be rendered at 138 kv or higher as designated by the company. Measurement of demand and energy hereunder will be at the delivery voltage and at a point designated by the company.

Filed under authority of Order No. 74-661-Y of the Public Utilities Commission of Ohio

TARIFF I.R.P. (Continued)
(Interruptible Power)

RATE

DEMAND CHARGE:
For each kw of monthly billing demand as determined below ... $1.23 per kw
For each kilovar of lagging kvar demand in excess of 50%
of the kw billing demand for such month ..... $0.434 per kvar

ENERGY CHARGE:
For the total kwhr taken ..... 0.53 cents per kwhr

ADJUSTMENT OF DEMAND CHARGE

If during any monthly billing period the company does not make available to the customer capacity equal to the monthly billing demand for 572 hours, the demand charge as computed above will be reduced .211 cent per kw of monthly billing demand for each hour of such deficiency below 572 hours.

MINIMUM CHARGE

This rate is subject to a minimum monthly charge equal to the demand charge for such month.

PAYMENT

Bills computed under this tariff are due and payable within 15 days of date of bill. On accounts not so paid, customer shall pay company interest on the unpaid amount at the rate of 8% per annum from the due date to the date of payment of said bills.

FUEL ADJUSTMENT CLAUSE

The cost of fuel chargeable to customers billed under this rate shall be calculated in accordance with the provisions of Rule No. 26 of the Public Utilities Commission of Ohio (PUCO) as set forth on Sheet No. 27.

BILLING DEMAND

Billing demand in kw shall be taken each month as the highest single 30-minute integrated peak in kw as registered during the month by a demand meter or indicator, but the monthly billing demand so established shall in no event be less than 67% of the greater of (a) the customer's contract capacity or (b) the customer's highest previously established monthly billing demand during the term of the contract, nor less than 20,000 kw.

The kvar demand shall be taken each month as the highest single 30-minute peak in kvar as registered during the month.

TERM OF CONTRACT

Contracts under this tariff will be made for initial periods of not less than 2 years with self-renewal provisions for successive periods of 1 year each, until either party gives at least 1 year's prior written notice to the other of its intention to terminate at the end of either the initial period or of any yearly period thereafter.

SPECIAL TERMS AND CONDITIONS

See Sheets No. 3 through 12 for Terms and Conditions of Service, except for Paragraph 1 of the section "Company's Liability" which does not apply to this tariff.

Filed under authority of Order No. 78 676 EL AIR of The Public Utilities Commission of Ohio

ADRESSE TELEGR
"DELTAMILL"

المؤسسة المصرية العامة للصناعات المعدنية

العنوان التلغرافي
« دلتامل »

(8)

(2)

شركة مصانع الدلتا للصلب

شركة مساهمة مصرية

DELTA STEEL MILL S. A. A.

Siège Sociale : 18 Rue Emad - El - Dine
Tél. 49572 — P. O. Box — Caire, R. A. U.
USINE : à Mostorod Tél. 871870/76/77/78

المركز الرئيسي : ١٨ شارع عماد الدين
تليفون ٤٩٥٧٢ - كيس بريد القاهرة
المصنع : مسطرد تليفون : ٨٧١٨٧٠/٧٦/٧٧/٧٨

Le Caire, le ١٩٨٠/٤/٢١ القاهرة في

April 21 - 1980

Votre Réf.
Notre Réf. أ هـ / ٩٨٨٢ / ١ / ٤

TO ACB

السيد المهندس / رئيس مجلس الادارة
المكتب العربي الاستشاري (منير الخولي)
٢ شارع صبري أبو علم

الموضوع : دراسة الجدوى الفنية والاقتصادية
لانتاج الفيرومنجنيز في مصر .

بعد التحية .

Here attached the reply of your questionnare of the our Company demand from FeMn owing to your letter 87/80 dated april 2 - 1980

مرفق طيه رد الشركة على الاسئلة الخاصة بتقدير احتياجات الشركة من الفيرومنجنيز
والواردة مع خطاب شركة سيناء للمنجنيز ٨٠/٦٧ بتاريخ ١٩٨٠/٤/٢ والمستلم في ١٩٨٠/٤/١٠ .

وتفضلوا بقبول فائق الاحترام ...

رئيس مجلس الادارة

Chairman

مهندس / مصطفى كمال الشريف

Eng Mostafa Kamal El Sherif

مرفقات :
رد الشركة على الاسئلة .

Copy to - SMC

صورة الى شركة سيناء للمنجنيز
١ شارع قصر النيل - القاهرة

ح ف / ش

Best Available Document

FERROMANGANESE CONSUMPTION

1) The quantity of Ferro-manganese consumed over the past 10 years in Electric arc, Induction and Cupola Furnaces :

Years	70	71	72	73	74	75	76	77	78	79
Fe Mn M.T.	412	428	550	590	697	622	517	705	750	702

2) The type and specification of the Ferro-manganese consumed including size required, manganese and carbon content.

2.1. Chemical Analysis :

2.1.1. Ferro-manganese (High Carbon) :

Mn	75 %	min.
C	7 %	max.
Si	2 %	max.
S	0.03 %	max.
P	0.35 %	max.

2.1.2. Ferro-manganese (Medium Carbon) :

Mn	80 %	min.
C	1 %	max.
Si	2 %	max.
S	0.03 %	max.
P	0.35 %	max.

2.1.3. Ferro-manganese (Low Carbon) :

Mn	80 %	min.
C	0.5 %	max.
Si	2 %	max.
S	0.03 %	max.
P	0.30 %	max.

NATIONAL METAL INDUSTRIES Co.

P.O.B. 1673, CAIRO, A.R.E.

(3)

Your Ref. _____

Our Ref. _____

Date, _____

K E C I / A C B

1 - A Ferro manganese Consumption :

1970	390	Tons
1971	480	Tons
1972	435	Tons
1973	395	Tons
1974	430	"
1975	535	"
1976	375	"
1977	370	"
1978	350	"
1979	670	"

Depending on quality of steel produced and quality of scrap

B. Basic Open Hearth

2 - Type and specifications

100 - 200	mm.	
Mn.	75 % min.	
C.	6-7 %	
P.	0.30% max.	
Si.	2.00% max.	
Sp. Gr.	7.5 gm/cm^3	

99

NATIONAL METAL INDUSTRIES Co.

P.O.B. 1673, CAIRO, A.R.E.

Your Ref. _____

Our Ref. _____

Date, _____

3 - CIF price	447.5	$	
clearance	10 L.E	/	Ton
Customs	5 %	/	"
transport	5 L.E	/	"

4 - 1980 - 700 Ton

1981 - 2000 1600 Ton (3 O. H. F. x 36 T)

5 - NO

6 - Yes - quantity depending on quality

7 - Yes

(4)

KECI/ACB
29/3/1980

QUESTIONNAIRE
FERROMANGANESE CONSUMPTION

Please advise the following information :

1. The quantity of ferromanganese consumed over the past 10 years - 1969 thru 1979 - in your steelmaking facilities as applicable :

   A. Basic Oxygen Furnace. X
   B. Open Hearth. 800 t } expected Consumption
   C. Electric Furnace. 400 t

2. The type and specification of the ferromanganese consumed including size required, manganese and carbon content. Mn > 75%
   C 6% max
   Size : 5 - 10 mm

3. The CIF price of the ferromanganese plus cost of clearance, customs, duties, transport and other costs delivered to your facility.

4. The projected consumption of ferromanganese at your facility over the next 20 years - 1980 thru 2000. 1500 t

5. Are you presently consuming any silico-manganese ? if so in what quantities ? NO

6. If you are not currently utilizing silico-manganese in your steel-making operations, would you consider its usage and, if so, in what quantity ? 200 t.

7. If silico-manganese is available from domestic sources, would you be willing to pay the normal premium for it above the costs of ferromanganese ? yes

JFS/rj

101

HELWAN IRON FOUNDRIES.

EX. F. 9

March 29 - 1980

I - Qty. of FE -MN (75 %) consumed over the last 10 years

500 tons.

2 - Specifications ,-

A) Technical Requirements: (Physical condition)

1) It shall be hard.
2) Dense not Friable.
3) Free from pores, slag, and inclusions & adhesions of other foreign material to give homogeneous mixture of molten metal.
4) melting temp. shall not be higher than 1250 °C
5) It shall be delivered in small pigs its size

1" - 8"	95 %
1"	5 %.

B) Chemical analysis :

		Percent	
Manganese ...	Mn ...	75.00	Min.
Carbon ...	C ...	6.00	Max
Silicon ...	Si ...	2.00	Max
Phosphorus...	P ...	0.30	Max
Sulphur ...	S ...	0.03	Max

3 - Price:

FOB Price US. D. 325 / 1976.

4 - 1500 tons.

D. Rah. m

(6)

شركة النصر للمسبوكات

إدارة الشئون الفنيـــة

القاهرة ١٩٨٠/٥/٧

May 7 - 1980

السيد المهندس/ رئيس مجلس ادارة

شركـــة سيناء المنجنيز

To SMC Chairman

Owing to your letter no 69/80 dated April 2 - 1980 for producing the required information for the feasibility study of FeMn

بالاشارة الى خطاب سيادتكم رقم ٨٠/٦٩ بتاريخ ٨٠/٤/٢

بخصوص البيانات المطلوبة لدراسة الجدوى الفنية والاقتصاديـــة

Here attached the reply to your question.

لانتاج الكيرو منجنيـــز.

أتشرف بأن أرفق لسيادتكـــم الرد علـــى الاسئلـــة الواردة

مـــن شركتكـــم.

وتفضلوا سيادتكم بقبول فائق الاحترام ...

مدير قطاع الصانع

مهندس

٥/٧

عبد الرازق حسين

Factories director

Eng. Abdel Razik Hessein

/ا

Informations about Ferromanganese Consumption

at El - Nasr Casting CO. " Alexandria Foundry "

1 - The quantity of ferromanganese over the post 6 years - 1974 - 1979 in our steel making foundry in the electric furnace as follows.

Year	1974	1975	1976	1977	1978	1979*
Quantity in ton	13.470	57.640	21.693	22.523	29.318	6.703

2 - The type of ferromanganese consumed : high carbon, low carbon

Size required : from 8 - 13 cm

Manganese and carbon content : A - low carbon : C 1.0-1.5%

Mn: about 75%

B - High carbon: C 5% - 6%

Mn: 65 - 70%

3 - The price of ferromanganese : 348 L.E. / ton

4 - Concerning the projected consumption, it is planned to produce 150 tons of all kinds of steel castings over the year 1980 classified as such: 120 tons carbon steel, 30 tons Mn-steel and other alloyed steels. This amounts to about 4.5 tons of l.c ferromanganese, 1.5 tons of H.c ferromanganese. Only the expected consumption during next year 1981 can be estimated to 6 tons l.c ferromanganese, 2 tons H.c ferromanganese.

5 - No, we are not consuming silico-manganese neither in the present time nor in the near future.

* The consumption during this year (1979) has been reduced due to the decrease in demand on Mn-steel castings .

مشروع مجمع الصلب المتكامل
لانتاج حديد التسليح بالدخيلة

مكتب المفوض

كتابنا رقم : ٤٤/٨٠ م

April 1st 1980

to SMC Chairman

السيد / المهندس رئيس مجلس اداره
شركه سيناء للمنجنيز
١ شارع قصر النيل / القاهره

Here attached the information of our demand for the Intergated steel Project at El Dikhela from Fe Mn

تحيه طيبه وبعد ،

أرفق بهذا البيان الخاص باحتياجات مشروع الصلب المتكامل بالدخيلة من الفيرومنجنيز والسيليكومنجنيز .

وتفضلوا بقبول فائق الاحترام ،،،

مفوض المشروع

دكتور / سمير طاهر
Dr. Samir Dahir

القاهرة فى ١ ابريل ١٩٨٠

مرفقات : عدد
١

السيد / مدير عام المصانع
ومدير مشروع الدراسه
للعلم واتخاذ اللازم ،
رئيس مجلس الاداره
٨٠/٤/٣

INTEGRATED STEEL PROJECT AT EL DIKHELA

Expected Date of Commissioning I984

Expected Consumption figures of FeMn and Si-Mn

Case I :

Fe-Mn only is used , 4860 tons of Fe-Mn per annum .

Case II :

Si-Mn ohly is used, 5786 tons of Si-Mn per annum.

Case III:

Both Fe-Mn and Si-Mn are used

Fe-Mn	972 tons/year
Si-MN	4628 tons/year.

If Si-Mn is avaialbel on the market at a competitive price Case III is recommended.

It is assumed that the chemical composition of Si-Mn comprises : -

Si	17%
Mn	63%
Fe	20%

The above consumption figures are calculated for the production of 810.000 tons of liquied steel per annum in electric arc furnvaces.

It is foreseen that the production capacity ofthe plant, and subsequently its consumption of ferro-alloys , will be increased by 50% around I988.

1 April I980.

KAISER ENGINEERS

File 971 692.D DAN

INTEROFFICE MEMORANDUM

TO R. B. Greenwalt
AT El Dorado - 4

DATE February 1, 1980

FROM D. F. Boyd

COPIES TO G. E. Aiken
G. F. Coope
J. F. Sulzbach
A. A. Wallach

AT El Dorado - 4

JOB NO. 80012

SUBJECT SINAI MANGANESE PROJECT
MANGANESE PRICES

The following manganese ores, alloys and metal products have been researched for an economic evaluation of their value for the past five years. The reference in all cases has been the Metals Bulletin, World Steel and Metal News. All quotations are in British Pound Sterling, unless noted.

	Date	Price
Manganese UK - Electro, minimum 99.95%, per metric ton, d/d (excl. duty)	01/08/80	650-655
	01/09/79	560
	07/11/78	660
	07/05/77	660
	01/11/77	660
	07/06/76	600
	01/06/76	575-595
	07/08/75	575-595
	01/07/75	575-595
Manganese Ore (Metallurgical) 48/50% Mn, max. 0.1%P, CIF Europe In U.S. Dollars per metric ton unit, Mn	01/08/80	$1.34-1.36
	06/19/79	1.34-1.36
	01/09/79	1.34-1.36
	07/11/78	1.34-1.36
	01/10/78	1.45-1.50
	07/05/77	1.45-1.50
	06/11/77	1.45-1.50
	07/06/76	1.45-1.50
	01/06/76	1.35-1.45
	07/08/75	1.35-1.45
	06/07/75	1.15-1.20
Manganese Ore - Battery Grade 70/85% MnO_2 Lump CIF Europe per metric ton	01/08/80	90-100
	07/19/79	90-100
	01/09/79	47-53
	07/11/78	47-53
	01/10/78	47-53
	07/05/77	47-53
	01/11/77	47-53
	07/06/76	47-53
	01/06/76	47-53
	07/08/75	47-53
	01/07/75	47-53

	Date	Price*
Silico-Manganese (lumpy) 65-75% Mn, basis Std., 20-25% Si	01/08/80	245-260
	06/19/79	235-255
	01/09/79	205-230
	07/11/78	205-230
	01/10/78	195-215
	07/05/77	215-240
	01/11/77	225-265
	07/06/76	225-245
	01/06/76	190-225
	07/08/75	240-260
	01/07/75	240-260

*Scale pro-rata
Discount, 10 Pounds Sterling for bulk

Refined Ferro-Manganese (78% Mn)
per Metric Ton Delivered to Works, U.K.

	PRICE*					
Date	0.5 - 0.1%C	0.5%C	1.0%C	1.5%C	2.0%C	High C
01/08/80	475 - 500	445-475	410-440	390-420	365-395	215-225
06/19/79	460 - 485	425-355	395-420	370-400	350-380	190-205
01/09/79	410 - 440	380-420	325-350	310-335	290-330	180-200
07/11/78	410 - 440	380-420	325-350	310-335	290-330	185-200
01/10/78	460 - 485	430-445	350-365	340-355	335-350	188-200
07/05/77	525 - 600	510-590	405-460	385-410	375-405	200-220
01/11/77	525 - 600	510-590	405-460	385-410	375-405	216-230
07/06/76	465 - 500	445-490	360-390	350-375	345-365	200-216
01/06/76	435-455	380-400	330-350	325-345	320-340	165-170
07/08/75	475 - 495	425-435	355-375	345-365	330-345	200-207
01/07/75	410 - 430	350-400	290-330	270-310	240-280	200-207

*Scale pro-rata

DFB/dz
Files 3.01 and 5.01

692 0

(5)

ACB

TRANSLATION

CENTRAL ~~AGENCY~~ AUTHORITY FOR PUBLIC MOBILIZATION & STATISTICS

From annual statistical year book issued 2 March 1980.

DATE: 2/3/1980

THE IMPORTS OF PIG IRON
DURING THE LAST TEN YEARS

CUSTOM ITEM	SUBJECT	YEAR	IMPORTS	
			Quantity/ ton	Price by LE
73/1	Pig iron including Crude Spigel iron or in blocks or similar forms.	70/71	48759	1833822
		71/72	59282	1979839
		1972	96317	2937862
		1973	45360	1332338
		1974	23257	598893
		1975	57341	3494953
		1976	36571	2458749
		1977	32649	1439117
		1978	28518	2484045
		1979	11406	1325431

الجهاز المركزى للتعبئة العامة والاحصاء

التاريخ ٢ / ٤ / ١٩٨٠

الواردات من الحديد الزهر
خلال العشر سنوات الأخيرة

كمية : طن
قيمة : جنيه

البند الجمركى	السلعة	السنة	الواردات	
			كمية	قيمة
١/٧٣	حديد صب (زهر) بما فى ذلك حديد صب (سبيجل) خاما أو سبائك أو كتلا أو بأشكال مماثلة .	٧١/٧٠	٤٨٧٥٩	١٨٣٣٨٢٢
		٧٢/٧١	٥٩٢٨٢	١٩٧٩٨٣٩
		١٩٧٢	٩٦٣١٧	٢٩٣٧٨٦٢
		١٩٧٣	٤٥٣٦٠	١٣٣٢٣٣٨
		١٩٧٤	٢٣٢٥٧	٥٩٨٨٩٣
		١٩٧٥	٥٧٣٤١	٣٤٩٤٩٥٣
		١٩٧٦	٣٦٥٧١	٢٤٥٨٧٤٩
		١٩٧٧	٣٢٦٤٩	١٤٣٩١١٧
		١٩٧٨	٢٨٥١٨	٢٤٨٤٠٤٥
		١٩٧٩	١١٤٠٦	١٣٢٥٤٣١

AG:3

From annual statistical yearbook issued 3 March 1980

TRANSLATION

CENTRAL AGENCY FOR PUBLIC
MOBILIZATION & STATISTICS

DATE: 2/3/1980

IMPORTS OF MANGANESE
DURING THE PERIOD OF 1954-1979

Custom Item	Subject	Year	IMPORTS	
			Quantity/ ton	Price by LE
26/1B	Manganese	1954	52	5303
		1960	1	94
		1961	206	15328
		1964	1	192
		68/69	91	7492
		71/72	729	68468
		1974	134	20600
		1975	193	19380
		1978	15	3570

no imports in these years which are not included in the above table.

الجهاز المركزى للتعبئة العامة والاحصاء

التاريخ ٢ /٤/ ١٩٨٠

الواردات من المنجنيز

خلال الفترة من عام ١٩٥٤ ـ ١٩٧٩

الكمية : طن

القيمة : جنيه

البند الجمركى	السلعة	السنة	الواردات	
			كمية	قيمة
٢٦/١ب	منجنيز	١٩٥٤	٥٢	٥٣٠٣
		١٩٦٠	١	٩٤
		١٩٦١	٢٠٦	١٥٣٢٨
		١٩٦٤	١	١٩٢
		٦٩/٦٨	٩١	٧٤٩٢
		٧٢/٧١	٧٢٩	٦٨٤٦٨
		١٩٧٤	١٣٤	٢٠٦٠٠
		١٩٧٥	١٩٣	١٩٣٨٠
		١٩٧٨	١٥	٣٥٧٠

السنوات الغير واردة فى الجدول لم يتم فيها استيراد

ACB

CENTRAL AUTHORITY FOR PUBLIC MOBILIZATION & STATISTICS

QUANTITY OF Mn. PRODUCTION DURING THE PERIOD OF 1960-1978

Sub	Quantity	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
Manganese	Thousand ton	276	278	151	49	328	182	186	75	4	4	4	4	2	3	5	4	4	4	*

* Less than thousand ton.

From Annual Yearbook, 1978

TRANSLATION

الجهاز المركزي للتعبئة العامة والاحصاء

٢/٤/١٩٨٠

كمية الانتاج من المنجنيز عن الاعوام من ١٩٦٠ الى ١٩٧٨ *

البيان	وحدة الكمية	١٩٦٠	١٩٦١	١٩٦٢	١٩٦٣	١٩٦٤	١٩٦٥	١٩٦٦	١٩٦٧	١٩٦٨	١٩٦٩	١٩٧٠	١٩٧١	١٩٧٢	١٩٧٣	١٩٧٤	١٩٧٥	١٩٧٦	١٩٧	١٩٧٨
المنجنيز	الف طن	٢٧٦	٢٧٨	١٥١	٤٩	٣٢٨	١٨٢	١٨٦	٧٥	٤	٤	٤	٤	٢	٣	٥	٤	٤	٤	

* اقل من الف طن

121
956
692 D

The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. Kaiser Engineers & Constructors Inc.
2 Moh. Sabry Abu-Alam St.,
Cairo - ARE.

Cairo In : May, 13. 1980.

Our Ref. No. 101/80.

Att : Mr. J. Sulzbzch
Program Manager.

Sub: Rates for use of pier at Abu-Zeniema

Dear Mr. Sulzbach.,

Reference to your letter No. 048 dated Apr. 21.1980. concerning the above subject .

We notify here that SMC. rented the pier at Abu-Zeniema for temporary works to the petroluem companies working in Suez Gulf at a rate ranging from 200 to 1400US $ per day .

The pier now is not in good conlition to allow for permenant uses.

Meanwhile we remain .

Sincerely Yours.

Geol. S. Demerdash.
(Contract Officer)

DISTRIBUTION
A. Wallach
R. Palmer
G. Aiken
G.F. Coope
R Greenwalt
D. Neuman
J. Sulzbach
J. Tilt
File, Oakland No. _____
File, Cairo, No. 121, 905
ACB, Cairo

TRANSLATION FROM THE ORIGINAL

ACB

Cairo 8/6/1980

Sinai Manganese Co.

To : General Director of Water Department
of Armed Forces - Supplies Branch

We beg to inform that the Company is ready to cooperated with you for transport and supply of potable water from Sinai to Abu Zeneima by the ship ( ) whose load is 150 tons monthly at a price of 6.750 pound/ton SIF your tanks at Abu Zeneima.

In case you accept our proposal, we beg to receive your official approval. The payment will be after the receival of your representative at Abu Zeneima as indicated on the respective receipts.

To mention is that the given price is reduced for the purpose of cooperation with the armed forces. The period of validity of this offer is one month from today.

Best wishes
General Director of Trade
Affairs

Accountant/Ahmed Mahmoud
El Kanawati

شركة سيناء للمنجنيز

إحدى شركات قطاع التعدين والحراريات

وزارة الصناعة والتعدين

١ شارع قصر النيل بالقاهرة ت ٧٥٧٣٩٥ تلغرافيا: سيماغ القاهرة

القاهرة في ١٩٨٠/٦/٨

السيد / مدير عام ادارة المياه بالقوات المسلحة

نوع التعويض

بعد التحيـــــة ...

نتشرف باحاطة سيادتكم بأن الشركة على استعداد للتعاون معكم لنقل وتوريد مياه عذبة من السويس الى منطقة أبو زنيمة على الناقلة البحرية (بعرض) وحمولتها ١٥٠ طن (مائة وخمسون طنا لا غير) تعويضا على أساس سعر الطن ٦٫٥٠ جنيها (ستة جنيهات و ٥٠ قرشا لا غير) تسلم في ميناء رجكم بأبي زنيمة .

فاذا وافقتم سيادتكم على عرضنا هذا نرجو التكرم بموافاتنا بالتصديق بالموافقة كما أن المحاسبة سوف تتم بعد استلام مندوبكم بأبي زنيمة الكمية واعتماد ايصالات الاستلام منه .

علما بأن السعر هذا يعتبر التعاون مع القوات المسلحة وهو أقل من الاسعار المتعامل بها على المياه في المنطقة ، ومدة سريان العرض شهر من تاريخه .

رجاء أن يحوز العرض موافقتكم .

وتفضلوا بقبول فائق الاحترام ...

مدير عام الشئون التجارية

محاسب /

أحمد محمود القواقي

١٩٨٠/٦/١٢

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The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. Kaiser Engineers & Constructors Inc.
2 Moh. Sabry Abu-Alam St.,
Cairo - ARE.

Cairo In : May,17,1980.

Our Ref. No: 102/80.

Att : Mr. J. Sulzbach.
Program Manager.

Dear Sir.

Referring to your letter dated March,30,1980, No: SM1-028, concerning statistical & Marketing data requirement.

Please find enclosed herewith a copy of the letter received from EL-Nasr Casting Company.

Meanwhile we remain .

Yours Sincerely ,
Mah. Abd El Khalek
Geol. S. Demerdash,
(Contract Officer).

Enc. 1.

DISTRIBUTION

A. Wallach w/o Att.
~~R. Palmer w/o Att.~~
J. Aiken
G.F. Coope
R. Greenwalt
D. Neuman
J. Sulzbach
J. Tilt w/o Att.
File, Oakland No. _____
~~File, Cairo No.~~ 121,925
~~AGE, Cairo~~

6

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The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. KECI.
Cairo - ARE.

Cairo In : 23June 1980.

Our Ref. No: 122/80.

Sub: Questinnnaire Fe.Mn. consumption .

Dear Sirs.

We have pleasure to attach herein a copy of the answere of your questionnaire KECI/ACB 29.3.1980, arrived from Helwan Iron Foundaries EX.F.9.

Mean-while we remain ,

Yours Sincrely

Geol. S. Demerdash
(Contract Officer)

enc. 2.

DISTRIBUTION
A. Wallach
R. Palmer
G. Aiken
G.F. Coope
R. Greenwalt
D. Neuman
J. Sulzbach
J. Tilt
[redacted] No.
File, Cairo, No. 121,925
ACB, Cairo

HELWAN IRON FOUNDRIES.

EX. F. 9

I - Qty. of FE -MN (75 %) consumed over the bast IO years 500 tons.

2 - Specifications ;-

A) Technical Requirements: (Physical condition)

I) It shall be hard.
2) Dense not Friable.
3) Free from pores, slag, and inclusions & adhesions of other foreign material to give homogeneous mixture of molten metal.
4) melting temp. shall not be higher than I250 °C
5) It shall be delivered in small pigs its size

I" - 8"	95 %
I"	5 %

B) Chemical analysis :

		Percent	
Manganese ...	Mn ...	75.00	Min.
Carbon ...	C ...	6.00	Max
Silicon ...	Si ...	2.00	Max
Phosphorus...	P ...	0.30	Max
Sulphur ...	S ...	0.03	Max

3 - Price:

FOB Price US. D. 325 / I976.

4 - I500 tons.

S. Rah. m

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The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. KECI
Cairo - ARE.

Cairo In : July 7 1980.

Our Ref No. 135/80.

Re : Questionnaire Fe.Mn. Consumption .

Att : Mr. J. Sulzbach
Program Manager

Dear Mr. Sulzbach,

We have pleasure to transmit herein the answers of questionnaire completed by Egyptian Copper Works Co. dated 30.3.1980. received us at 3.inst.

Meanwhile we remain .

Yours Sincerely

Geol. S. El-Demerdash
Contract Officer .

enc 1.

Distr — Cairo Files — 121, 925
ACB
JFS
Oakland:
Files
Greenwalt
Neumann

6

KAISER ENGINEERS

KAISER ENGINEERS AND CONSTRUCTORS, INC
300 LAKESIDE DRIVE
POST OFFICE BOX 23210
OAKLAND, CALIFORNIA 94623 · CABLE KAISENGS

PLEASE ADDRESS REPLY TO:
2, MOTI. SABRY ABU ALAM
P.O. BOX 2648
CAIRO, A.R.E.
Telex. 92564 ATLOZ UN/Phone 740151

Egyptian Copper Works Company
Hagar El Nawatia,
Ramelah,
Alexandria
Tel. 64432/64435

30 March 1980

Gentlemen:

Kaiser Engineers in association with Arab Consulting Bureau are currently engaged by the Sinai Manganese Company to conduct a Prefeasibility Study on production of ferromanganese in Egypt. To assist us in our study, we are writing to request that you complete the enclosed questionnaire in order to help us evaluate your present and projected requirements for ferromanganese in your steelmaking processes.

As our schedule for the Stage 1 work report is very tight, we are requesting that the questionnaire is completed and returned to us by April 30, at the Cairo address indicated above. If there are any questions please phone us at 740151.

We thank you in advance for your kind cooperation.

Very truly yours,
Kaiser Engineers & Constructors Inc.

John Sulzbach
PROGAM MANAGER

Encl. (1)
JFS/vh

MONIR EL KHOLY
ARAB CONSULTING BUREAU

2, SABRY ABU ALAM STREET
CAIRO - EGYPT
P. O. BOX 2648

TEL: 740151
CABLE: MOTAKHOLY CAIRO
TELEX 92564 ATLOZI UN

A RAYMOND INTE

KECI/ACB
29/3/1980

QUESTIONNAIRE
FERROMANGANESE CONSUMPTION

Please advise the following information :

1. The quantity of ferromanganese consumed over the past 10 years - 1969 thru 1979 - in your steelmaking facilities as applicable :

   A. Basic Oxygen Furnace. X
   B. Open Hearth. 800 t } expected Consumption
   C. Electric Furnace. 400 t }

2. The type and specification of the ferromanganese consumed including size required, manganese and carbon content. Mn > 75%
   C 6% max
   Size : 5 - 10 mm φ

3. The CIF price of the ferromanganese plus cost of clearance, customs, duties, transport and other costs delivered to your facility.

4. The projected consumption of ferromanganese at your facility over the next 20 years - 1980 thru 2000. 1500 t

5. Are you presently consuming any silico-manganese ? if so in what quantities ? NO

6. If you are not currently utilizing silico-manganese in your steel-making operations, would you consider its usage and, if so, in what quantity ? 200 t.

7. If silico-manganese is available from domestic sources, would you be willing to pay the normal premium for it above the costs of ferromanganese ? yes

JFS/rj

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The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. Kaiser Engineers & Constructors Inc.
2 Moh. Sabry Abu-Alam St.,
Cairo - ARE.

Cairo In : May,6.1980.
Our Ref. No. 95/80.

Att : Mr. Sulzbach,
Program Manager.

Dear Mr. Sulzbach,

Referring to your letter dated March,30.1980, No. SMC1-028 concerning statistical & Marketing data requirements .

Please find enclosed herewith a copy of the letter received from Delta Steel Mills Compay.

Meanwhile we remain .

Yours Sincerely,

Geol. S. Demerdash,
(Contract Officer).

Enc. 1

RECEIVED
6 MAY 1980
Kaiser Engineers, Inc
J. F. Sulzbach

DISTRIBUTION
A. Wallach
R. Palmer
G. Aiken
G. F. Coope
R. Greenwalt
D. Neuman
J. Sulzbach
J. Tilt
File, Oakland No. w/Att.
File, Cairo, No. 121,925 w/Att.
ACB, Cairo

TRANSLATION

El Delta Steel Company

Cairo, 21.4.1980

Chairman of Arab Consulting Bureau
Monir El Kholy
2 Mohamad Sabry Abu Alam St.
Cairo

Re: Feasibility Study for the Production of Ferro-Manganese in Egypt

Dear Sirs,

Referring to Sinai Manganese Company letter No. 67/80 dated 2.4.1980 which we received on 10.4.1980. Please find enclosed our reply about your questionaire concerning the requirement of our Company from Ferro-Manganese.

Chairman
Eng. Mostafa D. El Sherif

cc: Sinai Manganese Company
1 Kasr El Nil St.
Cairo

IMC 95/50

شركة الدلتا للصلب

١٩٨٠/٤/٢١

أ.د/ ٩٨٨٢

السيد المهندس / رئيس مجلس الادارة

المكتب العربي الاستشاري (منير الخولي)

٢ شارع صبري أبو علم

الموضوع : دراسة الجدوى الفنية والاقتصادية

لانتاج الفيرومنجنيز في مصر .

بعد التحية ،

مرفق طيه رد الشركة على الاسئلة الخاصة بتقدير احتياجات الشركة من الفيرومنجنيز والواردة مع خطاب شركة سيناء للمنجنيز ٨٠/٦٧ بتاريخ ١٩٨٠/٤/٢ والمسلم في ١٩٨٠/٤/١٠ .

وتفضلوا بقبول فائق الاحترام ،،،

رئيس مجلس الادارة

مهندس / مصطفى كمال الشريف

مرفقات :

رد الشركة على الاسئلة .

صورة الى شركة سيناء للمنجنيز

١ شارع قصر النيل ـ القاهرة

ح ف / ش

الجهاز العام للصلب

السيد المهندس مشروع الفيروشيم

مع جزيل الشكر وشاكرين صدر

الرد لهذا الرأي في الدراسة

المعدة الى من المشروع أيضا

٨٠/٤/٢٩

2.1.4. Ferro-manganese (Very low carbon) :

Mn	90 %	min.
C	0.10 %	max.
Si	1 %	max.
S	0.03 %	max.
P	0.10 %	max.

2.2. Size :

50 - 150 mm. of up to 10 Kg. in weight maximum.

3) The CIF price of the Ferro-manganese plus cost of clearance, customs, duties, transport and other costs delivered to our facility.

CIF price of the high carbon ferromanganese in the last imports of 1980 :

Price 355 L.E./M.T. Fe Mn.

Cost of clearance, customs, duties, transport and other costs comes to an average of 20 % of CIF price.

4) The projected consumption of Ferro-manganese at our facility over the next 20 years - 1980 thru 2000.

Besides the current consumption of Ferro-manganese by the year 2000 when all new projects under study and execution are finished. Consumption would increase by the following quantities :

High carbon Fe Mn about 1500 M.T.

Medium carbon Fe Mn about 500 M.T.

Low carbon Fe Mn about 30 M.T.

i.e. Total consumption of all grades of Fe Mn may reach about 2800 M.T. by the year 2000

5) Consumption of Silico-manganese is about 20 M.T./year.

6) ———

7) If Silico-manganese is available from domestic sources, we are ready to pay

EL NASR CASTING CO.
شركة النصر للمسبوكات

973
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692.0

إدارة الشئون الفنيـــة

7 May 1980
القاهرة ١٩٨٠/٥/٧

To Engr. Chairman SMIC
السيد المهندس/ رئيس مجلس ادارة

شركـــة سيناء للمنجنيز

تحية طيبة وبعد ...

According to your letter 69/80 dated
بالاشارة الى خطاب سيادتكم رقم ٨٠/٦٩ بتاريخ ٨٠/٤/٢
2 April 1980, the required details for preferibility
وبخصوص البيانات المطلوبة لدراسة الجدوى الفنية والاقتصاديـــة
study of ferromanganese, we enclose here
لانتاج الفيرومنجنيـــز.
The answers to the questionnaire
أتشرف بأن أرفق لسيادتكم الرد على الاسئلة الواردة
من شركتكـــم.

وتفضلوا سيادتكم بقبول فائق الاحترام ...

مدير قطاع الصناعة

مهندس
٥/٧

عبد الرازق حسين

/ل

Informations about Ferromanganese Consumption

at El - Nasr Casting CO. " Alexandria Foundry "

1 - The quantity of ferromanganese over the post 6 years - 1974 - 1979 in our steel making foundry in the electric furnace as follows.

Year	1974	1975	1976	1977	1978	1979*
Quantity in ton	13.470	57.640	21.693	22.523	29.318	6.703

2 - The type of ferromanganese consumed : high carbon, low carbon

Size required : from 8 - 13 cm

Manganese and carbon content : A - low carbon : C 1.0-1.5%

Mn: about 75%

B - High carbon: C 5% - 6%

Mn: 65 - 70%

3 - The price of ~~the~~ ferromanganese : 348 L.E. / ton

4 - Concerning the projected consumption, it is planned to produce 150 tons of all kinds of steel castings over the year 1980 classified as such: 120 tons carbon steel, 30 tons Mn-steel and other alloyed steels. This amounts to about 4.5 tons of l.c ferromanganese, 1.5 tons of H.c ferromanganese. Only the expected consumption during next year 1981 can be estimated to 6 tons l.c ferromanganese, 2 tons H.c ferromanganese.

5 - No, we are not consuming silico-manganese neither in the present time nor in the near future.

* The consumption during this year (1979) has been reduced due to the decrease in demand on Mn-steel castings .

ADRESSE TELEGR
" DELMILL "

المؤسسة المصرية العامة للصناعات المعدنية

العنوان التلغرافى
« دلمل »

شركة مصانع الدلتا للصلب

شركة مساهمة مصرية

DELTA STEEL MILL S. A. A.

Siège Sociale : 18 Rue Emad - El - Dine
Tél. 49572 — P. O. Box — Caire, R. A. U.
USINE : à Mostorod Tél. 871870/76/77/78

المركز الرئيسى : ١٨ شارع عماد الدين
تليفون ٤٩٥٧٢ - كيس بريد القاهرة
المصنع : مسطرد تليفون : ٧٨/٧٧/٧٦/٨٧١٨٧٠

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Le Caire, le 21 April 1980

القاهرة فى ١٩٨٠/٤/٢١

Votre Réf.
Notre Réf.

احالتكم
رقمنا أهـ/ ٩٨٨٢ / ٢ / ٤

السيد المهندس / رئيس مجلس الادارة
المكتب العربى الاستشارى (منير الخولى)
٢ شارع صبرى أبو علم

الموضوع : دراسة الجدوى الفنية والاقتصادية
لانتاج الفيرومنجنيز فى مصر .

بعد التحية ،

Enclose hereby the answer to the ferromanganese questionnaire according to your letter dated 2 April 1980

مرفق طيه رد الشركة على الاسئلة الخاصة بتقدير احتياجات الشركة من الفيرومنجنيز
والواردة مع خطاب شركة سيناء للمنجنيز ٨٠/٦٧ بتاريخ ١٩٨٠/٤/٢ بالمسلم فى ١٩٨٠/٤/١٠ .

وتفضلوا بقبول فائق الاحترام ،،،

رئيس مجلس الادارة

مهندس / مصطفى كمال الشريف

مرفقات :
رد الشركة على الاسئلة .

صورة الى شركة سيناء للمنجنيز
١ شارع قصر النيل - القاهرة

ح ف / ش

FERROMANGANESE CONSUMPTION

1) The quantity of Ferro-manganese consumed over the past 10 years in Electric arc, Induction and Cupola Furnaces :

Years	70	71	72	73	74	75	76	77	78	79
Fe Mn M.T.	412	428	550	590	697	622	517	705	750	702

2) The type and specification of the Ferro-manganese consumed including size required, manganese and carbon content.

2.1. Chemical Analysis :

2.1.1. Ferro-manganese (High Carbon) :

Mn	75 %	min.
C	7 %	max.
Si	2 %	max.
S	0.03 %	max.
P	0.35 %	max.

2.1.2. Ferro-manganese (Medium Carbon) :

Mn	80 %	min.
C	1 %	max.
Si	2 %	max.
S	0.03 %	max.
P	0.35 %	max.

2.1.3. Ferro-manganese (Low Carbon) :

Mn	80 %	min.
C	0.5 %	max.
Si	2 %	max.
S	0.03 %	max.

RECEIVED 6 MAY 1980 Kaiser Engineers, Inc J. F. Sulzbach

2.1.4. Ferro-manganese (Very low Carbon) :

Mn	90 %	min.
C	0.10 %	max.
Si	1 %	max.
S	0.03 %	max.
P	0.10 %	max.

2.2. Size :

50 - 150 mm. of up to 10 Kg. in weight max. m.

3) The CIF price of the Ferro-manganese plus cost of clearance, customs, duties, transport and other costs delivered to our facility.

CIF price of the high carbon ferromanganese in the last imports of 1980 :

Price 355 L.E./ M.T. Fe Mn.

Cost of clearance, customs, duties, transport and other costs comes to an average of 20 % of CIF price.

4) The projected consumption of Ferro-manganese at our facility over the next 20 years - 1980 thru 2000.

Besides the current consumption of Ferro-manganese, by the year 2000 when all new projects under study and execution are finished, Consumption would increase by the following quantities :

High carbon Fe Mn about 1500 M.T.

Medium carbon Fe Mn about 500 M.T.

Low carbon Fe Mn about 30 M.T.

i.e. Total consumption of all grades of Fe Mn may reach about 2800 M.T. by the year 2000

5) Consumption of Silico-manganese : about 20 M.T./year.

6) ——

7) If Silico-manganese is available from domestic sources, we are ready to pay

Oakland

971
692 D
(orig.)

JFS

الشركة الأهلية للصناعات المعدنية
مكتب
مدير عام المصانع

Hand delivered to Mr. [illegible]

Answer to Foreign Japanese Consumption Questionnaire in our letter of 29 March to National Metal Industries Co. (See SMI-028)

NATIONAL METAL INDUSTRIES Co.

P.O.B. 1673, CAIRO, A.R.E.

Your Ref. .....

Our Ref. .....

Date, ...

K E C I / A C B

1 - A Ferro manganese Consumption :

1970	390	Tons
1971	480	Tons
1972	485	Tons
1973	595	Tons
1974	450	"
1975	535	"
1976	375	"
1977	370	"
1978	350	"
1979	670	"

Depending on quality of steel produced and quality of scrap

B. Basic Open Hearth

2 - Type and specifications

100 - 200	mm.
Mn.	75 % min.
C.	6-7 %
P.	0.30% max.
Si.	2.00% max.
Sp. Gr.	7.5 gm/cm^3

WORKS : Abu Zaabal, Galioubia — Phone : 869718
CAIRO Office : 8, Emad El Din St., Cairo : 48621 — 74124
ALEX. Office : 23, El Tahrir Square : 21226

Cable : « NAMETIN » Cairo

NATIONAL METAL INDUSTRIES Co.

P.O.B. 1673, CAIRO, A.R.E.

Your Ref. .....

Our Ref. .....

Date, ...

3 - CIF price	447.5	$	
clearance	10 L.E	/ Ton	
Customs	5 %	/ "	
transport	5 L.E	/ "	

4 - 1980	- 700	Ton	
1981 - 2000	1600	Ton	(3 O. H. R. x 36 T)

5 - NO

6 - Yes - quantity depending on quality

7 - Yes

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971
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The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kaer El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. Kaiser Engineers & Constructors Inc.
2 Moh. Sabry Abu-Alam St.,
Cairo - ARE.

Cairo In: April.9.1980.

Att. Mr. J. Sulzbach
Program Manager

Our Ref. No. 77/80

Dear . Mr. Sulzbach ,

Please , find enclosed herewith the requirment of Integrated Steel Project At El-Dikhela from Fe-Mn and Si-Mn.

With our best regards.

Yours Sincerely

Geol. S. Demerdash
(Contract Officer)

Enc. 1.

Translate letter.

CC - Cairo - ACB
dES
Greenwalt
Neumann
File

Oakland - Wallach
Tilt
File

London - Palmer

RECEIVED
9 APR A.M.
Kaiser Engineers, Inc.
J. F. Sulzbach

ACB

STEEL COMPLEX PROJECT
FOR THE PRODUCTION OF
REINFORCED IRON - DEKHELA

Our ref: 44/80/M.M

Chairman
Sinai Manganese Co.
k Kasr El Nil Street - Cairo

Dear Sirs,

Please find enclosed herewith the requirement of Integrated Steel Project At El Dekhela, from Ferromanganese and

Please accept our best regards,

Authorized Project
Dr. Samir Taher

Cairo 1st April 1980
Encl. One

Mr./Factories Manager
Contracting Officer
For your information and to take the necessary measurments.

Chairman
3/4/1980

INTEGRATED STEEL PROJECT AT EL DIKHELA

Expected Date of Commissioning I984

Expected Consumption figures of FeMn and Si-Mn

Case I :

Fe-Mn only is used , 4860 tons of Fe-Mn per annum .

Case II :

Si-Mn only is used. 5786 tons of Si-Mn per annum.

Case III:

Both Fe-Mn and Si-Mn are used

Fe-Mn	972 tons/year
Si-Mn	4628 tons/year.

If Si-Mn is avaialbel on the market at a competitive price Case III is recommended.

It is assumed that the chemical composition of Si-Mn comprises : -

Si	17%
Mn	63%
Fe	20%

The above consumption figures are calculated for the production of 810.000 tons of liquied steel per annum in electric arc furnaces.

It is foreseen that the production capacity ofthe plant, and subsequently its consumption of ferro-alloys , will be increased by 50% around I988.

1 April I980.

مشروع مجمع الصلب المتكامل
لانتاج حديد التسليح بالدخيلة

مكتب المفوض

كتابنا رقم : ٤٤/٨٠ [illegible]

From Nikhel [illegible]

السيد / المهندس رئيس مجلس اداره
شركه سيناء للمنجنيز
١ شارع قصر النيل / القاهرة

تحيه طيبه وبعد ،

أرفق بهذا البيان الخاص باحتياجات مشروع الصلب المتكامل [illegible]
من الفيرومنجنيز والسيليكومنجنيز .

وتفضلوا بقبول فائق الاحترام ،،،

[illegible]

مفوض المشروع

[illegible]

دكتور / سمير [illegible]

القاهرة فى ١ ابريل ١٩٨٠

مرفقات : عدد
١

السيد / مدير عام المصانع
ومدير مشروع الدراسه
للعلم واتخاذ اللازم ،
رئيس مجلس الاداره
٨٠/٤/٣

INTEGRATED STEEL PROJECT AT EL DIKHELA

Expected Date of Commissioning 1984

Expected Consumption figures of FeMn and Si-Mn

Case I :

Fe-Mn only is used , 4860 tons of Fe-Mn per annum .

Case II :

Si-Mn ohly is used. 5786 tons of Si-Mn per annum.

Case III:

Both Fe-Mn and Si-Mn are used

Fe-Mn	972 tons/year
Si-MN	4628 tons/year.

If Si-Mn is avaialbel on the market at a competitive price Case III is recommended.

It is assumed that the chemical composition of Si-Mn comprises : -

Si	17%
Mn	63%
Fe	20%

The above consumption figures are calculated for the production of 810.000 tons of liquied steel per annum in electric arc furnvaces.

It is foreseen that the production capacity ofthe plant, and subsequently its consumption of ferro-alloys , will be increased by 50% around 1988.

1 April 1980.

type I estimate

DEFINITION OF TYPE I ESTIMATE For Economic Feasibility Studies

Basis

A Type I estimate can be based on assumed flowsheets and process requirements. Test work is desirable but not an absolute requirement if the process is generally well known. A visit to the actual plant site would be helpful. Design drawings are not prepared beyond sketches made by the project engineer. Equipment lists are prepared from the assumed flowsheets and priced on updated former quotations, telephone quotations from vendors' representatives, and occasionally letter quotes. Equipment specifications are not required, nor are formal vendors' proposals solicited. Total facility costs can be determined by roughly estimating the shelter volume and foundation concrete and applying unit costs. Percentage factors are used for installation of machinery. Electrical costs other than motors and substations are estimated as unit costs per installed horsepower. Percentage factors can be used for contractor's field overhead, construction plant, construction camp, design costs, procurement, and contractor's profit.

Information Required

It is necessary to know the geographical area of the project, the capacity required by the client, and some idea of the gross value of the raw material to be processed. For calculating operating costs, it is helpful to know the range of local labor rates, statutory and union required labor burden, and the approximate cost of basic supplies such as fuel, power, explosives, grinding media, reagents, etc.

Skills Employed

A Type I estimate can usually be made by a project engineer with experience in the industry covered by the feasibility study. Generally, design drawings and specifications are not prepared; however, recent Kaiser Engineers' experience in the construction of industrial facilities is used for updating percentage factors and other unit costs. Often the project engineer depends heavily on his personal acquaintances among vendors and operating companies and on his own experience in the industry.

Use of Estimates

A Type I estimate contains heavy contingencies.* These may range from 20% to 25% on structures and 10% to 15% on machinery. Kaiser Engineers believes that a Type I estimate may frequently be suitable to reject a project, but it is seldom adequate for positive acceptance of a project. A Type I estimate is often used for preliminary comparison of alternates and generally describes a hypothetical installation; it seldom becomes the basis for even conceptual design. It may, however, indicate the desirability of expanding the estimate to a Type II or Type III.

* In this definition the percentage assigned to contingencies is a judgment factor and is not to be interpreted as meaning that estimates are necessarily accurate within this percentage range, nor is there an implied reference to any order of accuracy.

type II estimate

DEFINITION OF TYPE II ESTIMATE For Economic Feasibility Studies

Basis

For a Type II estimate there should be sufficient bench-scale test work to determine the process flowsheet and approximate material balance, and to size various items of process machinery. One or more visits to the actual plant site are mandatory. Minimum general arrangement drawings are prepared, and major equipment lists are based on recent letter quotations from vendors. Specifications are not prepared, and inquiries are usually limited to a single vendor. Facility costs are estimated by making approximate quantity takeoffs from the general arrangement drawings and applying unit cost factors elsewhere. While foundation concrete and structural steel are not defined in detail, it is possible to make approximate estimates from the drawings. Machinery installation and electrical costs can be estimated more accurately than in a Type I estimate. However, percentage factors are still employed for many installation costs. Percentage factors are used to determine indirect costs.

Information Required

It is necessary to know the geographical area of the project, the capacity required by the client, and some idea of gross value of the raw material being processed. Written reports from competent metallurgical laboratories should be available concerning process requirements for calculating operating cost, actual labor contracts from the area should be obtained, and letter quotations should be received from suppliers of basic materials such as fuel, explosives, grinding media, reagents, etc. Written schedules should be obtained from utility companies serving the area.

Skills Employed

A Type II estimate is made under the supervision of a project engineer knowledgeable in the industry covered by the feasibility study. However, because of the existence of minimum general arrangement drawings, it is possible to seek the assistance of professional estimators familiar with the industry covered by the study.

Use of Estimates

Type II estimates still contain heavy contingencies,* amounting to 15% to 20% for structures and at least 10% for machinery and installation. A Type II estimate may be suitable to indicate feasibility, but it may not be adequate for budgeting the project, depending on individual client policy. A Type II estimate usually describes a conceptual installation that might be built rather than the installation which will be built.

* In this definition the percentage assigned to contingencies is a judgment factor and is not to be interpreted as meaning that estimates are necessarily accurate within this percentage range, nor is there an implied reference to any order of accuracy.

The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. Kaiser Engineers & Constructors Inc.
2 Moh. Sabry Abu-Alam St.,
Cairo - ARE.

Cairo In : April,30.1980.

Our Ref. No. 92/80.

Att : Mr. J. Sulzbach
Program Manager

Dear Mr. Sulzbach,

Referring to the telephone call between us, concerning the decision No.26/77 issued from the Minister of Rehabilitation & Reconstruction for clearance of the custom's duties of our equipments relating to our projects.

I have the pleasure to attach herewith for your attention a photo copy of this decision .

Meanwhile , We remain .

Yours Sincerely

A.H. El-Kanawatty,
Commercial Manager

Enc. 1

RECEIVED
30 APR 1980
Kaiser Engineers, Inc.
J. F. Sulzbach

TRIBUTION

. Wallach
Palmer
. Aiken
J.F. Coope
R. Greenwalt
D. Neuman
J. Sulzbach
J. Tilt
File, Oakland No. ← W/Att.
File, Cairo, No. 21 ← W/Att.
ACB, Cairo

ACB

Head of Ministers Board
Vice Minister for the Reconstruction
Affairs Office

Ministerial Decreto
No. 26 of 1977 year

Vice Minister for the reconstruction affairs :

After refering to law No. 43 of 1974 for the issuing of the descipline of the Investement of Arab Foreign Funds & the Free Zones.

And the Law No. 62 of 1974 concerning some of the reconstruction.

And the Law No. 113 of 1975 year for the amending of Law No. 62 of 1974 concerning some of the regulations of reconstruction.

And the President Decreto No. 250 of 1977 year for appointing a vice Minister for the reconstructions affairs in the Head Minister Board and defening his responsibilities

And on the Ministerial Decreto No. 242 of 1977 year for the taxes exemptations

And on what the Committee composed by the Minister Decreto No. 437 of 1975 year - for defening the operations and projects under the exemptation coming in Law No. 62 of 1974 year. amended by Law No 113 of 1975 year.

Decided

Article 1 - Sinai Manganese Mining Co 's projects in Sinai Peninsula are exempled from taxes and costum duties due to what the company import from the primary materials with all its kinds, the machines and equipments , trucks and vehicles and others from fixed and portable assets needed for these projects

Article 2 - S M C must offer the purchasing documents to the commettee composed by the ministerial decreto No 437 of 1975 year mentioned, to look for the documents approaval to offer it the taxes Administration, and this is after the approval of the Ministry of Industry and Mineral Wealth to get sure that these materials are for the projects inside Sinai and is covered by the exemptations stated in the above Article.

Article 3 - The Head of the Central organization of Reconstructions have to issue the needed instructions for the executions of this decreto.

Article 4 - This decreto to be published in the Governmental newspaper.

Vice Minister
for the Construction Affairs

Eng. Hasab Alla El-Kafrawy

MINISTERIAL DECREE
SMC DUTIES EXEMPTIONS

رئاسة مجلس الوزراء
مكتب نائب الوزير لشئون التعمير

(٦٤)

قـــــرار وزارى
رقـــم ٢٦ لسنـــة ١٩٧٧

نائب الوزير لشئون التعمير ،

بعد الاطلاع على القانون رقم ٤٣ لسنة ١٩٧٤ باصدار نظام استثمار المال العربى والأجنبى والمناطق الحرة ،

وعلى القانون رقم ٦٢ لسنة ١٩٧٤ فى شأن بعض الأحكام الخاصة بالتعمير ،

وعلى القانون رقم ١١٣ لسنة ١٩٧٥ بتعديل القانون رقم ٦٢ لسنة ١٩٧٤ بشأن بعض الأحكام الخاصة بالتعمير ،

وعلى قرار رئيس الجمهورية رقم ٢٥٠ لسنة ١٩٧٧ بتعيين نائب للوزير لشئون التعمير برئاسة مجلس الوزراء وتحديد اختصاصاته ،

وعلى القرار الوزارى رقم ٢٤٢ لسنة ١٩٧٧ بالاعفاءات الجمركية ،

وعلى ما عرضته اللجنة المشكلة بالقرار الوزارى رقم ٤٣٧ لسنة ١٩٧٥ لتحديد العمليات والمشروعات الخاضعة للاعفاءات الواردة بالقانون رقم ٦٢ لسنة ١٩٧٤ ، المعدل بالقانون رقم ١١٣ لسنة ١٩٧٥ ،

قـــــرر

مادة ١ — تعفى مشروعات شركة سيناء للمنجنيز فى شبه جزيرة سيناء من الضرائب والرسوم الجمركية المستحقة على ما تستورده الشركة من المواد الأولية بأنواعها والآلات والمعدات ووسائل النقل والانتقال وغيرها من الأصول الثابتة والمنقولة ، واللازمة لهذه المشروعات .

مادة ٢ — على شركة سيناء للمنجنيز تقديم مستندات الشراء الى اللجنة المشكلة بالقرار الوزارى رقم ٤٣٧ لسنة ١٩٧٥ المشار اليه للنظر فى اعتماد المستندات وتقديمها لمصلحة الضرائب ، وذلك بعد اعتمادها من وزارة الصناعة والثروة المعدنية للتأكد من أن هذه الأصناف مخصصة للمشروعات داخل سيناء ، ويشملها الاعفاء المنصوص عليه بالمادة السابقة .

مادة ٣ — يتولى رئيس الجهاز المركزى للتعمير اصدار التعليمات اللازمة لتنفيذ هذا القـــرار .

مادة ٤ — ينشر هذا القرار فى الوقائع المصرية .

نائب الوزير
لشئون التعمير
حسب الله الكفراوى

٧٧/٨٢٦

KAISER ENGINEERS

PROJECT TITLE SINAI MANGANESE Co. - MATERIALS HANDLING
CLIENT
LOCATION ABU ZENEIMA - EGYPT
Engineered Equip. FOR SAEF Pig Iron - FERROMANGANESE (Products)

JOB NO
DATE 6/23/82 BY J. Boyd
SHEET 1 OF

EQUIPMENT LIST AND COST ESTIMATE

* SUBMERGED ARC ELECTRIC FURNACE

LINE NO	COST ACCOUNT	EQUIP NO	SPEC NO	PLANT EQUIPMENT DESCRIPTION INCLUDING MOTORS, DRIVES, GUARDS, ETC.	KW	HP CONT	WEIGHT EACH Kg	INSTALLATION COST MAN WKS	MAN HOURS	ANCHOR BOLTS	EQUIP SALE	MATL MISC	SUB CONTRACT	AMOUNT	SALES TAXES	EQUIPMENT COST DUTY	FREIGHT	TOTAL EQUIP	TOTAL ESTIMATE
				Crushers	220	MWKE	59,000							306,000*			(1)		306,000
				Single Roll Crusher - Capacity @ minus 60mm product - 180 TPH. 100 TPH @ 25mm product.															
				BASIC PLANT—BARBER GREENE															
				1. 20" x 36" Jaw crusher with drive and guard.															
				2. 36" Gyrasphere crusher with drive and guard.															
				3. 36" x 12'-0" long Vibrating Grizzly-feeder with motor, drive and guard.															
				4. 4' x 14' — 2½ deck, Vibro-King screen with motor, drive and guard (no starter).															
				5. 84" diameter x 24" wide drum elevator with motor, drive and guard.															
				6. 30" x 46'-0" long in-plant screen feed conveyor with motor, drive and guard.															
				7. 24" x 14'-0" long return conveyor with motor, drive and guard.															
				8. Welded structural steel chassis, ~~blocking supports, jacks and king pin front end.~~															
				~~9. Triple rear axles with equalizers, pneumatic tires (12 - 19.00 x 20 x 16 ply) and air brakes on two axles.~~															
				10. Electric motor supports, all necessary supporting structures, hoppers and chutes.															
				EXTRAS FOR BASIC PLANT—															
				1. Mounting of electric motors on plant → (incl above)															
				2. ~~Tandem axle dolly with towing pole~~															
				3. Service platforms, ladders for screen } 2t															
				4. Operator's platform, ladders for Jaw crusher. }															
				5. Wiring of crusher electric motor(s) to starter(s) when motor(s) and starter(s) included.															
				6. Plant mounted control cabinet with starters, fuses and wiring for all plant mounted motors } → PLANT is complete electrically - Connection to customers power source is Req'd. ADD $ for LIGHTING crusher and immediate area															
				7. Variable speed feeder control, ~~for drum.~~ → (incl. above)															
				8. Extra wide feeder hopper — 1t															
				~~9. Hydraulic jacks (for raising and lowering screen.~~															
				~~10. Screen cover, bolts and frame.~~															
				11. Automatic oil pressure lubrication system for Jaw crusher										500					500
				~~12. Engineering details.~~															

PLANT - Model 36-JG-CC NOTE ON FREIGHT - Item 9 and part of 8 plus 9 & 11 of the extras are available for $22,000 ADDITIONAL - This would make PLANT portable from Alexandria or Suez to job site

* UNIVERSAL - BASIC PLANT (Two SKID Mid Stations) $330,875 - Including 2 3' NORDBERG Jaw Crushers Larger Jaw Crusher

KAISER ENGINEERS

PROJECT TITLE [illegible]
CLIENT
LOCATION [illegible]
MAT'L HANDLING - [illegible]

JOB NO. 80012
DATE 6/19/80 BY D. Boyo
SHEET 2 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION (INCLUDING MOTORS, DRIVES, GUARDS & BASES)	HP	DELIVERY DATA: FOB POINT	DELIVERY DATA: SHIPPING WEIGHT TOTAL KG	DELIVERY DATA: UNIT WT	MAN HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATL & HDLG	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FRT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
				1	CONVEYOR - 600 mm wide 80 [illegible] mm lift 22[illegible] mm c/w BELT components STRINGERS structural, ~~[illegible]~~ & DRIVE		MARS	22[illegible]							83[illegible]			1		83[illegible]
				1	MOTOR FOR ABOVE - [illegible] TEFC	7.5	MARS	INCL ABOVE							500			-		500
				1	DISCH chute to stacking Conv.			333												479
				1	Conveyor 460mm wide x 8000 mm, lift 1000 mm c/w Belt components, Stringers, structural, & drive, for -6MM FINES, TO DUMP TRUCK.		MARS	1400							5,200			[illegible]		5300
				1	MOTOR FOR ABOVE (3 HP) - TEFC	2.2	MARS								200			-		200
				-	~~SCREEN [illegible] CHUTE [illegible] UNDERSIZE HOPPER 0.3T~~															
				1	CONVEYOR - STACKING 600 mm wide 150° HORIZ ARC TRAVEL, MAX BELT HEIGHT 8200 mm, SLUGS LENGTH OF BELT 30000 mm. c/w TRAVEL, PNEUMATIC TIRE TRUCK ASSM'BLY, Luffo He Boom, ELECT. [illegible] CONV-BELT COMPONENTS & [illegible] (BARBER Greene - PK-210 Series, RADIAL STACKER) Also includes propel drive gearmotor and walkway with guardrail		AURORA ILL	18250							40,500					40500
				1	MOTORS FOR ABOVE - 20 HP - Conveyor; 7.5 HP Hoist; 2 HP Propel; incl. starters	22	AURORA ILL	INCL ABOVE							[illegible]					

KAISER ENGINEERS

PROJECT TITLE SINAI MANGANESE Co.
CLIENT
SITE ABU ZENEIMA EGYPT
MAT'L [illegible] SAE [illegible]

JOB NO 80012
DATE 6/27/80 BY D. Boyd
SHEET 3 OF 12

EQUIPMENT LIST AND COST ESTIMATE

1	SCALES - PLATFORM - 3000 x 12000 mm. Capacity 54 tons (120,000 pounds) FAIRBANKS TRUCK SCALE c/w platform - imbedded iron and rebar for deck, MECHANICAL beam weigh bar and all weather enclosure, insp. covers, sump pump. ~~For use in weighing general cargo and dump trucks~~ 4. For weighing front end loaders during furnace batching. Scale can be operated manually.	-	ST. JOHNSBURY V.T.	4250								9900			(1)			9900
1	DATA CENTER # 8811 & DATA PACE # 3600 - Remote located, in/out weighing, DATA Accumulation, inventory control - up to 80 different products c/w load cell. For automation of scale for batching. The S.A.E.F burden. - ALSO 4" DIGITAL READOUT FOR LOADER OPERATORS	-	V.T.	INCL ABOVE								8424			(1) *			8424
1	EXPORT PACKING 5% of $18324	-	-									900			—			900
1	ERECTION & CALIBRATION ENGINEER [illegible] $200 - [illegible]	-	-									4000			[illegible]			(4000)
1	SCALE PIT 40 [illegible] - 31 [illegible] EXCAVATE 115 [illegible] 23 cu [illegible]										12100							12100
1	Spindle [illegible] (Bearings [illegible]											700			—			700
															(1)			INCLUDED ITEM
	* [illegible] ELECTRICAL BOX [illegible]																	

KAISER ENGINEERS

PROJECT TITLE SINAI MANGANESE CO.
CLIENT MATI MINERALS
LOCATION ABU ZENEIMA, EGYPT
SAEF - PIG IRON - FE MN

JOB NO 80012
DATE 6/26/80 BY D. Boyd
SHEET 4 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIPMENT NO	QUANTITY	DESCRIPTION	MODEL NO	CAPACITY	WEIGHT (LBS) Kg	NO.	MAN HOURS	INSTALLATION COST: MATERIAL	LABOR	WAGE RATE	SUB CONTRACT	AMOUNT	EQUIPMENT COST: FREIGHT	DUTY	TAX	TOTAL EQUIP	TOTAL ESTIMATE
			1	BLENDING BAY - FOR [illegible] FURNACE BURDEN & BELT [illegible] - Reinforced Concrete 30 x 30 x 229 meters - 206 m³ (270 cu yds)									[illegible]						[illegible]
			1	SLAG Cooling Pits - Lo & Hi Mn Slag 184 m³ or 237 cu yds - EXCAVATION 20 m³ - 26 cu yds - BACKFILL 6.7 m³ - 8.7 cu yd of reinforced concrete constr. - Two pits									[illegible]						[illegible]
			~~1~~	~~Slag Cooling Pit - Three-Margin~~ No concrete - ~~EXCAVATION~~ ~~65 m³ - 84 yd³~~ Line with fines ~~7 m³ - 9 yd³~~									w/ civil						
			~~1~~	~~Cover for above 1/4" plate & angle iron~~ ~~7 tons - 15500 #, incl. wire rope sling for handling w/fork lift~~ ~~Overall size - 7300 x 7300 mm~~									w/ civil						
			1	Loader - Wheel Type - CAT 988B c/w closed cab. Air Cond, 50 AMP ALTERNATOR - 5.4 cu yd [illegible] Basic use - handling slag, [illegible] Heavy breakout force	—	Pacific III	38000							261,500		(1)			
			1	~~Truck - 955 highway Series R-25~~ - 25 Ton (22.5 million lbs) capacity. Either Dump or [illegible] Dump bed - std. constr. ~~[illegible]~~ ~~[illegible]~~ ~~For~~ slag handling		Gulf Part	17000							145,000					

(1) incl. [illegible] 176 M

KAISER ENGINEERS

PROJECT TITLE SINAI MANGANESE

CLIENT

LOCATION ABU ZENEIMA, EGYPT

MAT'L HANDLING - SITE PREP. FLOW

JOB NO. 80012

DATE 6/19/80 BY D. Boyd

SHEET 5 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO.	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION, INCLUDING MOTORS, DRIVES, GUARDS & BASES	HP	DELIVERY DATA: FOB POINT	DELIVERY DATA: SHIPPING WEIGHT ~~TOTAL~~ KG	INSTALLATION COST: UNIT M.H.	INSTALLATION COST: MAN-HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATE-RIAL	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FRT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
1				1	TOPPER & BELT FARING (BELT FEEDER) CRATE									2430						2430
2					[illegible]															
3					[illegible]															
4					[illegible]															
5					[illegible]															
6					[illegible]															
7																				
8				1	CONVEYOR - 400mm WIDE C/W															
9					BELT, COMPONENTS DRIVE &															
10					STRINGERS -															
11					Alt I - 90 meters @ $700/meter		MWKE	7150							63000			(1)		63000
12					~~Alt II - 70 meters @ $715/meter~~			~~5500~~							~~50,050~~					
13					Alt I - Closed Top Furnace, Alt II - Open top Furnace															
14				1	MOTOR FOR BELT															
15					Alt I 25 HP	19	MWKE								INCL ABOVE					
16					~~Alt II 20 HP~~	~~15~~	MWKE								~~INCL ABOVE~~					
17																				
18																				
19				LOT	GALLERY AND SUPPORTING STRUCTURE															
20					FOR CONVEYOR, INCL WALKWAY,															
21					SUPPORT BENTS, FOOTINGS ETC.															
22					PIPE & HVY STRUCTURAL MEMBERS,															
23					1 - Gravity Take up tower - 1000 Kg															
24					3 - BENTS, 10 & 12" pipe Constr - 6000 Kg									33400						33400
25					LOT Structural & X-members - 13900 Kg															
26					Walkway Steel Grating (600 sq ft) - 2450 Kg															
27				2	Loader, Wheel type - Caterpillar	-	Peoria Ill	27000							185,000			(1)		185,000
28					Model 950, with 2.0 m³ bucket															
29					Closed CAB & AIR Cond. 50 AMP															
30					ALT, STD CONSTR, OTHERWISE															
31																				
32					FOR MAT'L HANDLING TO AND FROM															
33					CRUSHER - [illegible]															

KAISER ENGINEERS

PROJECT TITLE [illegible] M. [illegible] NESE [illegible]

CLIENT

LOCATION [illegible]

JOB NO. 50012

DATE Jun 20 [illegible] BY [illegible]

SHEET 6 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION INCLUDING MOTORS, DRIVES, GUARDS & BASES	HP	DELIVERY DATA: FOB POINT	DELIVERY DATA: SHIPPING WEIGHT TOTAL KG	UNIT MH	MAN HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATERIAL	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FRT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
				1	Bulldozer Caterpillar D-7G	—	Peoria Ill	23700							173,000			(1)		173,000
					with Ripper															
					STD model with single shank															
					Ripper - Closed cab - Air conditioner															
					Filtered air, 50 amp alternator															
					(For General Use - Reclaiming Slags)															
				2	Loader - Bob Cat - Mod 731		Fargo N.D.	3[illegible]							31,000			(1)		31,000
					Diesel Engine Std Constr															
					(For charging sale, small units.															
					with 0.3 cu yd - 0.23 cu m capacity															
					[illegible]															
				1	Fork lift Truck - Caterpillar		Peoria Ill	8600							41,500			(1)		41,500
					Model V140, capacity 6000 KG															
					Diesel Engine - Pneumatic [illegible]															
					2400 mm forks Manual trans.															
					For loading & handling															
					shipping crates-or bins of Pig															
					or Fe-Mn Product															
				1	Fork lift Truck Caterpillar		Peoria Ill	3600							26,700			(1)		26,700
					Model V-30C with Hydraulic															
					2 Barrel handling attachment															
					[illegible] Capacity 150 KG.															
					Barrel [illegible] - Attachment $3125.															
																		(1) Incl as [illegible]		Incl
					[illegible]															
					and Barrel [illegible]															
					(55 GAL) of Fe-Mn															

KAISER ENGINEERS

PROJECT TITLE [illegible]

CLIENT [illegible]

LOCATION [illegible]

JOB NO

DATE BY

SHEET 7 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO.	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION, INCLUDING MOTORS, DRIVES, GUARDS & BASES	DELIVERY DATA: FOB POINT	DELIVERY DATA: SHIPPING WEIGHT TOTAL	INSTALLATION COST: UNIT M.H.	INSTALLATION COST: MAN HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATERIAL	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FPT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
1				2	Truck [illegible] - GMC [illegible] [illegible] - 5 speed manual transmission - Air [illegible] and air brakes, c/w 16 cu yd. 4.6 cu meter rear dump bed. FOR MATL HANDLING & Cleanup	[illegible]	12[illegible]							$68,000			(1)		$68,000
11				[illegible]	2 way Radio [illegible]		[illegible]												
13				[illegible]	Dust Suppression for yard [illegible] Consisting of [illegible] aluminum pipe, [illegible] with [illegible] and hose	[illegible]	500							5000			(1)		5000
18				1	[illegible] Pump, [illegible] turbine, 68 m³/hour (300 USGPM) at 689 kPa (100 psi) [illegible] This is an in line booster or canned pump, tapping sea water from the main [illegible] the [illegible]	[illegible]	8[illegible]							6[illegible]			(1)		6000
28				[illegible]	Pipe [illegible] 4" [illegible] 200 m [illegible] 656 [illegible]									4600			(1)		4600

KAISER ENGINEERS

PROJECT TITLE Sinq. [illegible]

CLIENT

LOCATION /

MATL HANDLING - SALT PIG IRON - FE MN

JOB NO [illegible]

DATE

BY

SHEET 8 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	ITEM NO	QUANT	DESCRIPTION	MATERIAL	WEIGHT TOTAL kg	MAN HOURS	LABOR HOURS	FOREMAN HOURS	MATL COST	SUB CONTRACT	AMOUNT	SALES TAXES	DUTY	FOB	TOTAL EQUIP	TOTAL ESTIMATE
					Dust [illegible]	Fa							[illegible]			(1)		9000
					relative [illegible]													
					Match. Corp. of equip. [illegible]													
					[illegible] pump													
					for [illegible], booster pump,													
					[illegible] compound prop [illegible] pump													
					float & flow [illegible] spring													
					[illegible] Include [illegible]													
					[illegible] selected valves [illegible]													
					[illegible] system at crusher													
					contact [illegible]													
					[illegible]													
					Fr [illegible] line, 2" (50mm) pipe								2000					2000
					Stor [illegible]		Ore Preparation & Sizing								Equipment			1249824
					[illegible] 20 [illegible]										Materials			129060
					Bun [illegible] 656 ft													
				1	Dust collector, wet type [illegible]				Incl. [illegible]				Performance [illegible]					
				1	Thickener [illegible] for [illegible]	.75 Cals SF	3400						38000			(1)		38000
					mild steel [illegible] - Dens.													
					Equ [illegible]													
					flow meter - tank - [illegible]													
				1	Pump [illegible]	.75 [illegible]	300						[illegible]			(1)		1900
					[illegible]													
					[illegible]											(1) Incl. as line item		
					Sheet [illegible]													

KAISER ENGINEERS

PROJECT TITLE Sinai [illegible]

CLIENT

LOCATION [illegible]

MAT'L HANDLING - SALE - PIG IRON TO MN

JOB NO 80012

DATE 5/30/80 BY D. Bowi

SHEET 9 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION INCLUDING MOTORS DRIVES GUARDS & BASES	KW	INSTALL DATA FOB POINT	WEIGHT EACH TOTAL Kg	UNIT WT	MAN HOURS	INSTALLATION COST LABOR & BURDEN	EQUIP USAGE	MATERIAL	SUB CON TRACT	EQUIPMENT COST AMOUNT $	SALES TAXES	DUTY	FRT	TOTAL EQUIP	TOTAL ESTIMATE
1				1	Pump - Water [illegible] to Dust collector - Goulds 2.0/1.5 Model 3755, c/w [illegible]		Los Angeles CA	75							900			(1)		900
5				1	Motor, Elect 10 HP, 1750 RPM	7.5	Los Angeles	60							500			-		500
6											Wet Dust Collection				41300			Equipment		41300
7															—			Materials		—
8																				
9				1	Screen - To-Mn Product [illegible] Triple Deck - 125, 75 and 6 mm openings - U.S. Type [illegible] screen. 2400 [illegible] ~~motor~~ + 1 set of screen [illegible] (Screen cloth #340)		Mentor Ohio	2050							10,700			(1)		10,700
16				1	Motor 7.5 HP TEFC	5.6	Mentor Ohio	Incl Above							400			—		400
19				1	Bunker for Screen products Reinforced Concrete constr. Slab 9100 [illegible] walls } 45 yd³ or 34 m³									12400						12400
23					Excavation 30 yd³ ; 23 m³ - No Backfill															
24				1	Rehabilitate Ag Cascade Machine Drive w/Reducer Piping [illegible] Plain									1000	[illegible]					1000
25																				1000
26																				
27																				
28																				
29					Piping - 6mm [illegible] + 50mm [illegible] Iron															
30					3 Screen Discharge Chutes 1 T															
31					Screen [illegible] 0.8 T													(1) Incl as line item		
32					AR Liner 1/4" thick 0.3 T.															
33					Screen Feed Hopper 1 T															

KAISER ENGINEERS

PROJECT TITLE Sinai [illegible]

CLIENT

LOCATION [illegible]

MAT'L HANDLING - SALF Pig Iron FeMn

JOB NO. 80012

DATE 7/1/80 BY D. Boyd

SHEET 10 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	VEL NO	QUANT	EQUIPMENT DESCRIPTION INCLUDING MOTORS, DRIVES, GUARDS & BASES	WT (KG)	DELIVERY DATA: FOB POINT	DELIVERY DATA: SHIPPING WEIGHT TOTAL	UNIT MH	MAN HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATERIAL	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FPT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
1				1	Jaw Crusher - DENVER [illegible] S30 [illegible] Operating [illegible] Shipping [illegible] [illegible]		[illegible]	[illegible]							[illegible]			(1)		28000
2																				
3																				
4																				
5																				
6																				
7				1	Motor for [illegible] 200 HP	22									INCL ABOVE			-		-
8																				
9																				
10				1	Portable Conveyor - Belt width 900 - Belt [illegible] 12000 - [illegible] 3.6 to 5.2 m - [illegible] Product to Screen - S/S unions for [illegible] hydraulic [illegible] belt and [illegible] Rexnord Constr. Equip - BOB CLARK Mfg Rep -	-	MADISON WI	4500							19000			(1)		28000
11																				
12																				
13																				
14																				
15																				
16																				
17																				
18																				
19				1	Motor for [illegible] 20 [illegible]	15	-	INCL ABOVE							INCL ABOVE			-		-
20																				
21																				
22				1	Structural Supports for Crusher									3300						3300
23																				
24					Pipe 12 Ø 700 kg															
25					Structural Steel Hvy 1200 Kg															
26					Handrails & 1" Str. Steel 300 Kg															
27					Grating 100 Kg															
28					incl less - 20% - for cutting															
29					Concrete for stairtreads 0.01 m³															
30																		(1) INCL AS LINE ITEM		
31					(Str. [illegible] #61															
32																				
33																				

KAISER ENGINEERS

PROJECT TITLE SINAI MANGANESE CO
CLIENT
LOCATION ABU ZELEIMA
MAT'L HANDLING - SACF PIG IRON - FE MN

JOB NO 80012
DATE 7/2/82 BY D. Boyd
SHEET 11 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION INCLUDING MOTORS, DRIVES, GEARS & MAKE	DELIVERY DATA: FOB POINT	DELIVERY DATA: WEIGHT EACH (LBS)	INSTALLATION COST: UNIT WT	INSTALLATION COST: MAN HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATERIAL	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT $	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FRT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
				1	STRUCTURAL support for Fe MN screen lower.								3700						3700
					Hvy Structural 1800 kg														
					Lt Structural 300 kg														
					Grating 100 kg														
					Hand rails 400 kg														
					Incl 20% for cutting etc														
					Concrete from stair treads 0.1 m³														
				2	Slag pot carrier - Capacity of transporting 3.5 m³ metal ladle's and 10.6 m³ slag pot and 9.2 m³ scrap pot. Kress Corp Model P-110 slag pot carrier. - Max load 50t, dry load 33t - c/w earthmover tires. Prime mover Caterpillar 615 Scraper Tractor (Deduct $5000/unit for airplane type tires) One unit is essentially standby - To give 100% availability, Two are req'd.	BRIMFIELD ILL. near Peoria Ill. 32800.							474,000			(1)		474 000
				1	WATER TRUCK - 8000 gallon (30280 l). - c/w CAT 621C Hauler, A.C. Cab, and salt water corrosion kit	Phoenix Az 41000.							33000			(1)		33000
					unit $221,000														
					cab 10,000								*246,000						
					Sea Water 15,000														
					Incl pump - Front & rear sprinkle.														
				2	Scrap Boxes (2 [illegible] meters 19 m³ [illegible] (For [illegible] [illegible] Total [illegible] - 9[illegible]								12000			(1) INCL AS LINE ITEM			12000

KAISER ENGINEERS

PROJECT TITLE SINAI MANGANESE CO
CLIENT
LOCATION ABU ZENEIMA - EGYPT
MAT'L HANDLING - SAEF - PIG IRON - FEMN

JOB NO 80012
DATE Jul/10/80 BY D. Boyd
SHEET 12 OF 12

EQUIPMENT LIST AND COST ESTIMATE

LINE NO	COST ACCOUNT	EQUIP NO	SPEC NO	QUANT	EQUIPMENT DESCRIPTION INCLUDING MOTOR DRIVES, GUARDS & BASES	DELIVERY DATA: FOB POINT	DELIVERY DATA: SHIPPING WEIGHT TOTAL Kg	INSTALLATION COST: UNIT WT	INSTALLATION COST: MAN HOURS	INSTALLATION COST: LABOR & BURDEN	INSTALLATION COST: EQUIP USAGE	INSTALLATION COST: MATERIAL	INSTALLATION COST: SUB CONTRACT	EQUIPMENT COST: AMOUNT	EQUIPMENT COST: SALES TAXES	EQUIPMENT COST: DUTY	EQUIPMENT COST: FRT	EQUIPMENT COST: TOTAL EQUIP	TOTAL ESTIMATE
1				1	SCALES PLATFORM 3000 x 21300 MM. Capacity 54 tons - Standard weigh scale, c/w printer for weight TICKETS SCALE MOD 11-4304 - FOR OR receipts plant products & GEN. CARGO Includes sump pump and 4 INSP. COVERS.	OAKLAND	7500							19,450			(1)		
2				LOT	EXPORT PACKING 5% of 19450									975					975
3				LOT	ERECTION & CALIBRATION ENGR.		INCL. ON sheet 3 with batching scale												
4					Scale Pit 70 cu yd - 54 cu meters concrete; 1000# (454 kg) re-bar. EXCAVATION 200 cu yd - 153 cu.m. BACKFILL 40 cu yd - 30.5 cu.m.								21000						21000

TOTALS

PRODUCT HANDLING		
	EQUIPMENT	79525
	MATERIALS	58400
SCRAP HANDLING		
	EQUIPMENT	474000
	MATERIALS	66500
WATER TRUCK		33000

(1) INCL AS LINE ITEM

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 07-25-80
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
SITE PREPARATION				
FENCING	2740 M	77 LE	211000	
LANDSCAPING	ALLOW		150000	
STREET PAVING	40000 M²	14 LE	560000	
DEMOLITION, CLEANUP	ALLOW		50000	
TOTAL, SITE PREPARATION			971000	
SEWAGE SYSTEM				
EXCAVATION	16400 M³	2 LE	33000	
PIPING	ALLOW		129000	
VALVES & VALVE WELLS	ALLOW		55000	
MANHOLES & STORM SEWERS	ALLOW		97000	
PUMP STA. STRUCTURE & ACCESSORIES	ALLOW		69000	
PUMPS	3 EA	$10000		30000
ELECTRIC MOTORS	2 EA	$7000		14000
DIESEL ENGINE & GEAR BOX	1 EA			21000
SWITCHGEAR PANELS, WIRING	LOT			57000
STABILIZATION POND	50000 M³	3.70 LE	185000	
FILTERS, EFFLUENT TANKS, ETC.	ALLOW		40000	
TOTAL, SEWAGE SYSTEM			588000	122000
WATER SUPPLY & FIRE PROTECTION				
150 MM STEEL PIPE	5460 M	14.25 LE	78000	
100 MM STEEL PIPE	5740 M	11.00 LE	63000	
50 MM PVC PIPE	1900 M	5.50 LE	10000	
25 MM PVC	1400 M	3.00 LE	4000	
VALVES, ASSORTED	ALLOW		40000	
FIRE HYDRANT	35	148 LE	5000	
75 MM PVC PIPE	1000 M	9.00 LE	9000	
PUMP, ELECTRIC	3 EA	$10000	20000	30000
FIRE PUMP, DIESEL	1 EA		20000	30000
REPAIR STORAGE TANKS	ALLOW		16000	
REPAIR SEA WATER PUMPS	ALLOW		10000	
REPAIR FIRE PUMPS	ALLOW		10000	
DESIGN, PERMITS, SUPERVISION	1 EA		2000	1000
SUBTOTAL, WATER			263000	1060000

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 07-28-
JOB NO. 80012
ESTIMATOR: COOPE

		Quantity	Unit Cost	Domestic Cost, LE	Foreign Cost, $US
	ADU TENERA				
	RESIDENCES 40% MARR, 10% LOCAL LABOR				
1	REPAIR CHAIRMAN VILLA	1		7000	
2	REPAIR TYPE A	19	4000 LE	76000	
3	REPAIR TYPE B	25	6800 LE	170000	
4	REPAIR TYPE C	44	5000 LE	220000	
5	REPAIR TYPE D	13	5950 LE	77000	
6	APPLIANCES, FURN. TYPE A	20	3300 LE	66000	
7	APPLIANCES, FURN. TYPE B	25	3850 LE	96000	
8	APPLIANCES, FURN. TYPE C	44	5900 LE	260000	
9	APPLIANCES, FURN. TYPE D	13	6100 LE	79000	
10	TOTAL, RESIDENCES			1051000	
11					
12					
13					
14	PUBLIC BUILDINGS				
15	REPAIR STAFF CLUB	ALLOW		15000	
16	APPLIANCES, FURNITURE	ALLOW		5000	
17	REPAIR WORKERS CLUB	ALLOW		5000	
18	ADDITIONAL FURNISHINGS	ALLOW		2000	
19	REPAIR CINEMA	ALLOW		8000	
20	EQUIPMENT, SEAT	ALLOW		17000	
21	BUILD NEW MOSQUE	286 M²	140 LE	40000	
22	MOSQUE FURNITURE	ALLOW		500	
23	BUILD NEW POST OFFICE	143 M²	140 LE	20000	
24	P.O. EQUIP. & FURN.	ALLOW		4000	
25	BUILD FIRE & POLICE STA.	428 M²	140 LE	60000	
26	EQUIPMENT, FURNISHINGS*	ALLOW		260000	
27	REPAIR RESTAURANTS	ALLOW		18000	
28	REPAIR [illegible]	ALLOW		35000	
29	REPAIR SHOPPING CENTER	ALLOW		20000	
30	BUILD NEW [illegible]	257 M²	140 LE	36000	
31	SHOP EQUIP. & FURN.	ALLOW		14000	
32	REPAIR ICE PLANT	ALLOW		10000	
33	ICE MAKING EQUIPMENT	ALLOW		30000	
34	BUILD NEW SCHOOL	1179 M²	140 LE	165000	
35	SCHOOL EQUIP. & FURN.	ALLOW		50000	
36	REPAIR FIRST AID CLINIC	ALLOW		10000	
37	BUILD COVER [illegible]	214 M²	140 LE	30000	
38	FIRST AID EQUIP. & FURN.	ALLOW		60000	
39	BUILD AMBULANCE STA.	286 M²	140 LE	40000	
40	AMB. STA. EQUIP., FURN.*	ALLOW		10000	
	SUBTOTAL, THIS PAGE			794000	

* MAJOR EQUIPMENT EXCLUDED

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 08-01-80
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
PUBLIC BUILDINGS (CONT.)				
SUBTOTAL, BROUGHT FORWARD			794000	
GASOLINE STATION	80 M²	140 LE	11000	
GASOLINE TANK, PUMPS, MISC.	ALLOW		50000	
PLAYING FIELDS & EQUIP.	ALLOW		30000	
TOTAL, PUBLIC BUILDINGS			895000	
POWER GENERATION & DISTR.				
FUEL SUPPLY SYSTEM				
GAS-LIQUID SEPARATION PLANT	BY OIL COMPANY			
COMPRESSOR STATION				
GAS PIPELINE, 200 MM	53.000 M	19 LE	1007000	
PRESSURE REGULATION STA.	1 EA		2000	12000
CENTRIFUGAL DEMISTER	1 EA		4000	
GAS FILTER	1 EA		1000	2000
DIESEL OIL TANK 120M³	1 EA		19000	
OIL FLOW CONTROL SYST.	1 EA		1000	4000
OIL PUMP	2 EA	$12000	1000	4000
MISC. PIPE, VALVES	ALLOW		4000	
			1039000	22000
GENERATION SYSTEM				
BUILDING REPAIRS	ALLOW		140000	
REMOVE EXIST. EQUIP.			32000	
REPAIR BRIDGE CRANE	ALLOW		9000	40000
TURBINE FOUNDATIONS	100 M³	150 LE	15000	
TURBINES, FOB USA	2	$2200000		4400000
INSTALLATION, AUX. EQUIP.	ALLOW		2800000	260000
REPLACE AUX. GENERATORS	2	$120000	7000	240000
SUBTOTAL GEN. SYST.			3101000	4940000

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 08-04-80
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
POWER GENER. & DISTR. (CONT.)				
DISTRIBUTION SYSTEM				
11 KV FEEDER TO SMELTER			75000	
11 KV SMELTER SUBSTATION	INCLUDED	IN SMELTER	CAPITAL	COST
OVERHEAD LINE	5 KM	9000 LE	27000	
SHOP & WAREHOUSE SUBSTA.	1 EA		9000	
TOWNSITE SUBSTATION	1 EA		7000	
SERVICE PICK SUBSTATION	1 EA		8000	
LOW VOLTAGE CABLE	LOT		9000	
SUBTOTAL, POWER DISTR.			130000	
MISCELLANEOUS				
STREET LIGHTS	ALLOW		35000	
TELEPHONE SYSTEM			4000	2000
SUBTOTAL, MISC.			39000	2000
TOTAL, POWER GEN. & DIST.			430000	4982000
LOADOUT & SERVICE PICKS				
LOADOUT PICK, INSTALLED			0	
SERVICE PICK STRUCT. REPAIR	ALLOW		200000	
REPAIR GANTRY CRANE			7000	40000
TOTAL, L.O. & S. PICKS			207000	40000
ADMINISTRATIVE OFFICES				
BUILDING & FURNISHINGS	ALLOW		38000	
FURNITURE, EQUIPMENT	ALLOW		30000	30000
RADIO SYSTEM	ALLOW			20000
			68000	50000

SINAI MANGANESE Co.
INFRASTRUCTURE
WORK REPORT

DATE: 08-05-[illegible]
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
MAINENANCE SHOP & WAREHOUSE				
REPAIR BUILDINGS	ALLOW		14000	
VEHICLE MAINT. EQUIP.				
STEAM CLEANING UNIT	1 EA			4500
LUBRICATION SYSTEM	1 EA			11300
TIRE CHANGER, LIGHT	1 EA			1600
TIRE CHANGER TRUCKS	1 EA			1600
TIRE BREAKER	1 EA			9300
TRUCK LIFT 4T	1 EA		1300	
CLEANING TANK	1 EA		300	
AUTOFRAME HOIST, 2.7T	1 EA		700	
TRUCKFRAME HOIST 6.4T	1 EA		1100	
JIB CRANE, 2T	1 EA		1900	
FLOOR CRANE 10T	1 EA		3100	
EM. [illegible] TESTING EQUIP.	LOT			10000
BATTERY CHARGER	1 EA			14700
VALVE SEAT GRINDER	1 EA			1000
WORK BENCHES, LOCKERS	LOT		1600	
SUBTOTAL MAINT.			9000	54000
MACHINE SHOP EQUIPMENT				
FRAME PRESS, 150T	1 EA			13900
DRILL PRESS, 50mm	1 EA			15600
PRECISION GRINDER 32x254	1 EA			2800
LATHE 400x2000 mm	1 EA			36200
LATHE 600x5000 mm	1 EA			77600
MILLING MACH. 1320x712x500	1 EA			64200
ARBOR PRESS, 15T	1 EA			700
BOLT & PIPE THREADER 50 & 150	1 EA			27100
POWER HACKSAW, 320mm	1 EA			11900
FLOOR CRANE, 10T	1 EA		2100	
JIB CRANE, 2T	1 EA		1900	
WORKBENCHES, LOCKERS	LOT		1000	
SUBTOTAL, MACH. SHOP			5000	230000

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 08-05-80
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
MAINTENANCE SHOP & WAREHOUSE				
ELECTRIC & INSTR. SHOP EQUIP.				
JIB CRANE 2 T	1 EA		1900	
STARTING CHARGING TESTER	1 EA			500
BATTERY STARTER TESTER	1 EA			400
HI POT TEST TRANSFORMER	1 EA			600
ELECTRICAL TEST EQUIP.	LOT			20,300
INSTRUMENT TEST EQUIP.	LOT			20,200
WORK BENCHES, LOCKERS	LOT		1100	
SUBTOTAL, ELECTRICAL			3000	42,000
WELDING SHOP EQUIPMENT				
JIB CRANE, 2 T	1 EA		1900	
FLOOR CRANE, 1 T	1 EA		2100	
PLATE SHEAR, 29 X 2250 MM	1 EA			28,300
PLATE ROLL, 32 X 2440 MM	1 EA			9000
POWER HACKSAW 320 MM	1 EA			11,900
GAS WELDING & CUTTING EQUIP.	6 SET	1150		6900
WELDER, 400 AMP	6 EA		2000	12,000
WELDER, 600 AMP	4 EA		2800	11,200
WELDER, 400 AMP INVERTER	1 EA			5700
BAR STORAGE RACK	LOT		1000	
WORK BENCHES, LOCKERS	LOT		1200	
SUBTOTAL, WELD SHOP EQUIP.			11,000	85,000
BLACKSMITH SHOP EQUIP.				
FORGE	1 EA		1600	
FURNACE STRESS RELIEF	1 EA			42,000
FURNACE HEAT TREAT	1 EA			9000
AIR HAMMER 230 KG	1 EA			72,000
ANVIL & MISC.	A-ON		5000	
WORK BENCHES, LOCKERS	LOT		400	
SUBTOTAL, BLACKSMITH SHOP			7000	123,000

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 08-15-8[illegible]
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
MAINTENANCE SHOP & WAREHOUSE				
FUEL STATION				
REPAIR BUILDING, RAMP	ALLOW		13000	
DIESEL TANK, 120 M³	1 EA		24000	
DIESEL UNLOADING SYSTEM	1 EA			23000
FILL PUMP	2 EA	$ 5500		11000
UNDERGROUND TANK, 50 M³	2 EA		18000	
SUBTOTAL, FUEL STATION			55000	34000
MISCELLANEOUS EQUIPMENT				
CENTRAL AIR COMPRESSOR	1 EA			9000
SANDBLAST SYSTEM	1 EA			1000
CONVEYOR VULCANIZER	1 EA			[illegible]
CONVEYOR BELT REEL	2 EA		1000	
TOOL CRIB SHELVING	LOT		4000	
HAND TOOLS FOR SHOP	ALLOW			50000
OFFICE FURN. EQUIP.	ALLOW		5000	
			9000	38000
MOBILE EQUIPMENT				
BACK HOE	1 EA			70000
MOBILE CRANE 75 T	1 EA			450000
MOBILE CRANE 25 T	1 EA			200000
TRUCK MOUNTED MAN LIFT	1 EA			70000
FORK LIFT, 4T	1 EA			32000
MAGULAN [illegible]	1 EA			30000
FLAT BED TRUCK W/HOIST	1 EA			25000
STAKE BODY TRUCK	2 EA	$ 13000		26000
4-WHEEL DRIVE VAN	1 EA			16000
GARBAGE TRUCK	1 EA			32000
FIRE TRUCK	1 EA			85000
TOW TRUCK	1 EA			67000
BUS 24 SEAT	1 EA			38000
PICKUP TRUCK	7 EA	$ 12000		84000
WATER TRUCK	1 EA			30000
STEEL GARBAGE BINS	20 EA	$ 1250		25000
LOCAL TRANSPORT, ERECTION	ALLOW		50000	
SUBTOTAL, MOBILE EQUIP.			50000	2700[illegible]

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 08-05-80
JOB NO. 80012
ESTIMATOR: COOPE

ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
MAINTENANCE SHOP & WAREHOUSE				
WAREHOUSE				
SHELVES, BINS, RACKS	ALLOW		5,000	
FURNITURE EQUIPMENT	ALLOW		5,000	5,000
SECURITY DOORS	2 EA	1,000	2,000	
FENCING	130 M	77 LE	10,000	
SUBTOTAL, WAREHOUSE			84,000	5,000
SUMMARY, MAINT. SHOP & W'HSE.				
REPAIR BUILDINGS			14,000	
VEHICLE MAINT. EQUIP.			9,000	54,000
MACHINE SHOP EQUIP.			5,000	230,000
ELECTR. & INSTR. SHOP EQUIP.			3,000	42,000
WELDING SHOP EQUIP.			11,000	85,000
BLACKSMITH SHOP EQUIP.			7,000	123,000
FUEL STATION			55,000	340,000
MISCELLANEOUS EQUIPMENT			9,000	28,000
MOBILE EQUIPMENT			50,000	1,270,000
TOTAL MAINT. SHOP & W'HSE			163,000	1,936,000
LABORATORY				
BUILDING	445 M²	140 LE	62,000	
JAW CRUSHER	1 EA			3,000
PULVERIZER	2 EA	$ 2,800		5,600
ROTAP MACHINE	1 EA			1,500
PLATFORM SCALE, 250 KG	1 EA		500	
DAVIS TUBE	1 EA			4,000
FILTER & VACUUM PUMP	1 EA			500
ANALYTICAL BALANCE	2 EA	$ 500		1,000
SAMPLE SPLIT	2 EA	$ 700		1,400
BINOCULAR MICROSCOPE	1 EA			800
CARBON-SULFUR ANALYZER	1 EA			3,000
pH METER	1 EA			500
DRYING OVEN	1 EA			3,000
GLASSWARE	LOT			5,000
HOOD & FAN	1 EA		1,000	
CHEM. CALS	LOT		15,000	2,000
BENCHES, SINKS, BURNER	LOT		30,000	
OFFICE FURN. EQUIP.	LOT		2,000	17,000
TOTAL, LABORATORY			70,000	33,000

SINAI MANGANESE CO.
INFRASTRUCTURE
WORK REPORT

DATE: 08-11-80
JOB NO. 80012
ESTIMATOR: COOPER

	ABU ZENEIMA	QUANTITY	UNIT COST	DOMESTIC COST, LE	FOREIGN COST, $US
	SUMMARY DIRECT COSTS				
1	SITE PREPARATION			971,000	0
2	SEWAGE SYSTEM			588,000	122,000
3	WATER SUPPLY & FIRE PROTECTION			263,000	1,060,000
4	RESIDENCES			1,051,000	0
5	PUBLIC BUILDINGS			895,000	0
6	POWER GENERATION & DISTRIBUTION			4,302,000	4,982,000
7	LOADOUT & SERVICE PIERS			207,000	40,000
8	ADMINISTRATIVE OFFICE			68,000	50,000
9	MAINTENANCE SHOP & WAREHOUSE			163,000	1,936,000
10	LABORATORY			70,000	33,000
11	TOTAL ABU ZENEIMA INFRASTRUCTURE			8,585,000	8,223,000
12					
13					
14	MINESITE INFRASTRUCTURE				
15					
16	SUMMARY - DIRECT COSTS				
17	SITE PREPARATION			2000	
18	SEWAGE SYSTEM			9000	
19	WATER SUPPLY			6000	
20	BUILDINGS			56000	
21	POWER GENERATION			6000	2300
22	TOTAL MINESITE INFRASTRUCTURE			79000	2300
23					
24	SUBTOTAL, DIRECT COSTS, INFRASTRUCTURE			8,664,000	8,246,000
25	CONTINGENCY ON DIRECT COSTS			1,862,000	842,000
26	TOTAL DIRECT COSTS			10,526,000	9,088,000
27					
28	INDIRECT COSTS, INFRASTRUCTURE				
29	FREIGHT			65,000	476,000
30	ENGINEERING, SUPERVISION & PROCUREMENT			388,000	707,000
31	CONSTRUCTION MANAGEMENT			418,000	199,000
32	SUBTOTAL, INDIRECT COSTS, INFRASTRUCTURE			881,000	2,382,000
33					
34	TOTAL COST, INFRASTRUCTURE			11,407,000	11,470,000
35					
36					
37					
38					
39					
40					

SING[illegible] CO. 1 8

[illegible] SCHEDULE

ADMINISTRATIVE DEPT.	[illegible]	[illegible]	CLER. SEC.	[illegible]	[illegible]	B	C
RESIDENT GENERAL MANAGER	1		1	2			
MINE SUPER. INTENDENT	1		1	2			
SMELTER SUPERINTENDENT	1		1	2			
POWER HOUSE SUPERINTENDENT			1	[illegible]			
[illegible]			1	[illegible]			
CHIEF ENGINEER & STAFF	3		3	6			
TOWNSITE MANAGER	1		1	2			
PURCHASING AGENT		1	4	5			
SAFETY DIRECTOR			1	2			
SECURITY DIRECTOR		1	8	9			
INDUSTRIAL RELATIONS MANAGER		1		2			
CHIEF ACCOUNTANT		1	5	6			
	9	5	26	40			
MINE STAFF*							
MINE ENGINEER		1		1			
MINE FOREMAN		2		2			
MAINTENANCE FOREMAN		1		1			
SHIFTERS		1		1			
CLERKS			1	1			
		5	1	6			
* MINE SUPERINTENDENT [illegible]							
[illegible]							

SUNAL MANGANESE CO
MANNING SCHEDULE

2 - 8
07-17-8[illegible]

SMELTING STAFF	EXEC	STAFF	CLER. SECR.	TOTAL
FURNACE SUPERINTENDENT	1		1	2
PACKING & SHIPPING SUPERINTENDENT	1		1	2
SMELTING DATA CLERK	1			1
PRODUCTION ENGINEER	1		1	2
SMELTING SHIFT FOREMAN		4		4
RAW MATERIALS SUPERVISOR		1	1	2
PACKING SUPERVISOR		1		1
SHIPPING SUPERVISOR		1	1	2
	4	7	5	16

POWERHOUSE - DESA - PLANT STAFF				
POWERHOUSE ENGINEER	1		1	2
DESA - MATERIALS ENGINEER	1			2
SHIFT SUPERVISOR		4		4
	2	4	2	8

MAINT. DEPARTMENT STAFF				
ASSIST. MAINTENANCE SUPERINTENDENT	1		1	2
CASING - PREPARATION SUPERVISOR		1		1
MECHANICAL MAINT. SUPERVISOR		1	1	2
WELDING SHOP SUPERVISOR		1	1	2
ELECTRICAL & INSTRUMENT SUPERVISOR		1	1	2
MOBILE EQUIPMENT SUPERVISOR		1	1	2
	1	5	5	11

SINAI MANAGEMENT CO
MANNING SCHEDULE

TOWNSITE STAFF	EXEC	STAFF	CLERICAL	TOTAL
CLINIC DIRECTOR	1		1	2
RESIDENT PHYSICIAN	1			1
TOWNSITE SERVICES DIRECTOR		1	1	2
CLUB DIRECTOR		1	1	2
MEDICAL TECHNICIAN		4		4
ACCOUNTANT			2	2
HOUSEKEEPER			1	1
SUBTOTAL TOWNSITE STAFF	2	6	6	14
LABORATORY STAFF				
CHIEF ANALYST		1	1	2
ANALYSTS			4	4
SUBTOTAL LAB STAFF		1	5	6
TOTAL EMPLOYEES	18	28	51	97

SINAI MANGANESE CO
MANNING SCHEDULE

07-17-80
COOPE

	ALT 1 1-SAE			ALT 2			ALT 3 DR + DAE		
MINE OPERATIONS LABOR	S	U	T	S	U	T	S	U	T
DRILLERS	6		6						
HEAVY EQUIPMENT OPERATORS	6		6						
CABLE MEN		3	3						
BIN MEN		3	3						
SERVICE MEN		4	4						
COMPRESSOR MEN		2	2						
LOAD HAULERS		4	4						
LABOR		5	5						
TRUCK DRIVERS	12		12						
SUBTOTAL, MINE OPERATIONS	24	21	45						
MINE MAINTENANCE LABOR									
MECHANIC A	10		10						
MECHANIC B	8		8						
ELECTRICIAN	2		2						
LABORERS		6	6						
TIRE REPAIR AND LABOR		4	4						
WELDER	2		2						
SUBTOTAL, MINE MAINTENANCE	22	10	32						
TOTAL, ALL LABOR	46	31	77						

SMELTER OPERATIONS LABOR	ALT. 1 1-SAEF S	U	T	ALT. 2 2-SAEF S	U	T	ALT. 3 DR+DAEF+SAEF S	U	T
RAW MATERIAL PREPARATION									
LOADER OPERATOR	2		2	2		2	2		2
TRUCK DRIVER	3		3	3		3	3		3
CRUSHER SCREEN OPERATOR	1		1	1		1	1		1
CONVEYOR MAN - OILER	1		1	1		1	1		1
BULLDOZER OPERATOR	1		1	1		1	1		1
CLEANUP MAN	—	3	3	—	3	3	—	3	3
SUBTOTAL, RAW MATER PREP.	8	3	11	8	3	11	8	3	11
RAW MATERIAL CHARGING									
LOADER OPERATOR	8		8	12		12	16		16
TRUCK DRIVER	1		1	2		2	3		3
CONVEYOR MAN - SCALE MAN - OILER	4		4	8		8	12		
BIN MAN - LABORER		4	4		8	8		12	12
SUBTOTAL, RAW MATER CHARGING	13	4	17	22	8	30	31	12	43
DIRECT REDUCTION									
BURNER MAN							4		4
BURNER HELPER								4	4
KILN FEED MAN								4	4
KILN DISCHARGE MAN								4	4
FAN - DUST COLLECTION MAN							4		4
CLEANUP MAN								4	4
SUBTOTAL D.R.							8	16	24
FURNACE OPERATION									
CONTROL ROOM OPERATOR	4		4	4		4	4		4
CONTROL ROOM HELPER	4		4	8		8	8		8
TAPPER	4		4	8		8	8		8
TAPPER HELPER		4	4		8	8		8	8
CRANE OPERATOR	4		4	8		8	8		8
LADLE CARRIER OPERATOR	4		4	8		8	8		8
RUNNER LABOR		4	4		8	8		8	8
SUBTOTAL, FURNACE OPERATION	20	8	28	36	16	52	36	16	52

SINAI MANGANESE CO.
MANNING SCHEDULE

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07-18-80
COOPE

	ALT. 1 1-SAEF			ALT. 2 2-SAEF			ALT. 3 DR+OAI		
SMELTER OPERATIONS LABOR (CONT.)	S	U	T	S	U	T	S	U	T
ELECTRODE CASING & LADLE REPAIRS									
CASING WELDER	1		1	2		2	2		2
WELDER HELPER		1	1		2	2		2	2
BRICKLAYER	1		1	2		2	2		2
BRICKLAYER HELPER		2	2		4	4		4	4
SUBTOTAL - OPERATING REPAIRS	2	3	5	4	6	10	4	6	10
PACKING - SHIPPING									
LEAD MAN	1		1	1		1	1		1
LOADER OPERATOR	2		2	2		2	2		2
FORKLIFT OPERATOR	2		2	2		2	2		2
CRUSHER OPERATOR	2		2	2		2	2		2
CRUSHER HELPER		2	2		2	2		2	2
SAMPLER	2		2	2		2	2		2
LABORER		4	4		4	4		4	4
SUBTOTAL - PACKING SHIPPING	9	6	15	9	6	15	9	6	15
TOTAL, SMELTER OPERATING LABOR	52	24	76	79	39	118	96	59	155
LABORATORY LABOR									
SAMPLE PREPARATION MAN	4		4	4		4	4		4
LABORER		2	2		3	3		3	3
SUBTOTAL - LABORATORY LABOR	4	2	6	4	3	7	4	3	7
POWERSTATION DESAL. PLANT OPER. LABOR									
CONTROL ROOM OPERATOR, POWERSTATION	4		4	4		4	4		4
CONTROL ROOM OPERATOR DESALINATION	4		4	4		4	4		4
CONTROL ROOM HELPER	8		8	12		12	12		12
FUEL SYSTEM OPERATOR	4		4	4		4	4		4
WATER DISTRIBUTION OPERATOR	4		4	4		4	4		4
CLEANUP MAN		2	2		2	2		2	2
SUBTOTAL P.S. - DESAL. LABOR	24	2	26	28	2	30	28	2	30

SINAI MANGANESE CO
MANNING SCHEDULE

07-18-2
COOPE

MAINTENANCE DEPARTMENT LABOR	ALT. 1 1-SACF S	U	T	ALT. 2 2-SACF S	U	T	ALT. 3 DR+OAEF+SACF S	U	T
MACHINIST	8		8	8		8	9		9
TRUCK & TRACTOR MECHANIC	6		6	6		6	7		7
WELDER, CASING SHOP	1		1	2		2	2		2
PRESS OPERATOR, CASING SHOP	3		3	5		5	5		5
PRES. OPERATOR HELPER		3	3		5	5		5	
BLACKSMITH, CASING SHOP	1		1	2		2	2		2
BLACKSMITH HELPER		1	1		2	2		2	
WELDER, GENERAL	8		8	9		9	10		10
MILLWRIGHT	4		4	5		5	6		6
ELECTRICIAN	11		11	13		13	14		14
INSTRUMENT MAN	3		3	3		3	4		4
CARPENTER	2			2		2	2		
PIPEFITTER-PLUMBER	2		2	2		2	2		2
OILER		4	4		4	4		4	4
VEHICLE DRIVER	9		9	9		9	9		9
MOBILE CRANE & HEAVY EQUIP. OPER.	3		3	3		3	3		3
LABOR GANG LEADMAN *	1		1	1		1	1		1
LABOR GANG *		6	6		6	6		6	6
HELPER		47	47		50	50		56	56
FUEL STATION ATTENDANT		4	4		4	4		4	4
SUBTOTAL MAINTENANCE LABOR	62	63	125	70	71	141	76	77	153
TOWNSITE LABOR									
COOK	6		6	6		6	6		6
ASSISTANT COOK		6	6		6	6		6	6
WAITER		6	6		6	6		6	6
HOUSEBOY		6	6		6	6		6	6
AMBULANCE DRIVER			1	1		1	1		1
FIREMAN	3		3	3		3	3		3
FIRE TRUCK DRIVER	1		1	1		1	1		1
	11	18	29	11	18	29	11	18	29

* GARBAGE COLLECTION, PIER UNLOADING, MISCELLANEOUS JOBS

SINAI MANGANESE CO.
MANNING SCHEDULE
SUMMARY

EMPLOYEES	EXEC	STAFF	CLER, SERV.	TOTAL
ADMINISTRATIVE OFFICE	9	5	28	42
MINE	0	5	1	6
SMELTER	4	7	5	16
POWERSTATION - DESAL PLANT	2	4	2	8
MAINTENANCE DEPT	1	5	5	11
TOWNSITE	2	6	6	14
LABORATORY	0	1	5	6
TOTAL EMPLOYEES, INCLUDING MINE	18	33	52	103

	ALT. 1 1-SAEF			ALT. 2 2 SAEF			ALT. 3 DRIDA		
LABOR	S	U	T	S	U	T	S	U	T
SMELTER OPERATIONS	52	24	76	79	39	118	96	59	155
LABORATORY	4	2	6	4	3	7	4	3	7
POWERSTATION - DESAL. PLANT	24	2	26	28	2	30	28	[illegible]	30
MAINTENANCE DEPARTMENT	62	63	125	70	71	141	76	77	153
TOWNSITE	11	18	29	11	18	29	11	18	29
SUBTOTAL, ABU ZENIMA LABOR	153	109	262	192	133	325	[illegible]	[illegible]	[illegible]
MINE LABOR	46	31	77	-	-	-	-	-	-
TOTAL LABOR, A-Z + MINE	199	140	339	-	-	-	-	-	-
TOTAL ABU ZENIMA PAYROLL			359			422			471
TOTAL PAYROLL, A-Z PLUS MINE			442			-			-

000544 ★ -6. JUNI 1980

Elkem-Spigerverket a|s
Engineering Division

Middelthuns gate 27
P.O. Box 5430
Oslo 3
Norway

Telex: 18 229
Telephone: (02) 46 68 70

Kaiser Engineers
Kaiser Center
P.O.Box 23210
300 Lakeside Drive
Oakland
California 94623
USA

Confirmation of

TELEX

Telex operator sign.

Your ref.	Our ref.	Oslo,
	LGH/EKE/P.5129	June 6, 1980

Tel-address

335326 kaiser serv.

We hereby confirm our message of today as follows

Att: Mr. R.B. Greenwalt

SINAI MANGANESE SMELTER PLANT - ABU ZENEIMA PROJECT

We refer meeting in our office April 16, 1980 and to our letter of April 21, regarding the above project and are pleased to submit our budget cost estimates for:

1) Rehabilitation of existing 13,2 MVA ELKEM smelting furnace for FeMn and Pig Iron comprising the following equipment.

1. Electrode holder assembly with hydraulic slipping and hoist.
2. (Furnace cover). Gas seals for electrodes.
3. (Furnace body). Lining materials for furnace body excluding refractory bricks. Fans for cooling of furnace bottom.
4. Tapping launders.
5. Equipment for tap hole operation.
6. Smoke hood with stack.
7. Gas cleaning plant.
8. Secondary current supply.
9. Furnace transformer.
10. High tension equipment.
11. Control and regulating equipment.
12. Motor control center.
13. Ladles and ladle tilter.
14. Water cooling equipment.
15. Electrode casing workshop.
16. Spare parts for approx. 2 years.

Approx. NOK 22.400.000,-

RECEIVED
JUN 17 1980
Kaiser Engineers, Inc.
R. B. Greenwalt

RECEIVED
JUN 16 1980
Accounts Payable

Elkem-Spigerverket a/s
Engineering Division

Middelthuns gate 27
P.O. Box 5430
Oslo 3
Norway

Telex: 18 229
Telephone: (02) 46 68 70

Kaiser Engineers

Confirmation of

TELEX

Telex operator sign.

Your ref. | Our ref. | Oslo, June 6, 1980

Tel-address

335326 kaiser serv.

We hereby confirm our message of today as follows

The above price includes pertinent engineering, fees for know how and rights, packing for overseas transport and is based upon delivery FOB European ports.

Estimated CIF-cost is	Approx. NOK 23.600.000,-
An estimate for our expert services connected to erection and commissioning is	Approx. NOK 700.000,-
An estimate for the erection job of the above equipment is:	Approx. NOK 2.500.000,-

2) One 13.2 MVA ELKEM Smelting furnace for FeMn and Pig Iron comprising the following equipment:

1. Electrode holder assembly with hydraulic slipping and hoist.
2. Furnace cover.
3. Furnace body.
4. Tapping launders.
5. Equipment for tap hole operation.
6. Smoke hood with stack.
7. Charging equipment.
8. Gas cleaning plant.
9. Secondary current supply.
10. Furnace transformer.
11. High tension equipment.
12. Control and regulating equipment.
13. Motor control center.
14. Ladles and ladle tilter.
15. Water cooling equipment.
16. Rotary kiln with bag filter.
17. Crane in tapping bay.
18. Weighing plant for raw materials with steel bin battery.
19. Electrode casing workshop.
20. Spare parts for approx. 2 years.

Approx. NOK 48.900.000,-

2025 6-79 Cicero a.s 5000

Elkem-Spigerverket a/s
Engineering Division

Middelthuns gate 27
P.O. Box 5430
Oslo 3
Norway

Telex: 18 229
Telephone: (02) 46 68 70

Kaiser Engineers

Confirmation of

TELEX

Telex operator sign.

Your ref. | Our ref. | Oslo, June 6, 1980

Tel-address
335326 kaiser serv.

We hereby confirm our message of today as follows

The above price is based on same conditions as for item 1.

Estimated CIF-cost is: Approx. NOK 51.400.000,-

An estimate for our expert services connected to erection and commisssiong is: Approx. NOK 850.000,-

An estimate for the erection job of the above equipment is: Approx. NOK 6.500.000,-

Item 16,17 and 18 (bin battery only) are included in the above amount of NOK 48,9 mills. with the following prices:

Item 16. Rotary kiln with bag filter
Approx. NOK 16.300.000,-

Item 17. Crane in tapping bag
Approx. NOK 3.300.000,-

Item 18. Weighing plant. Bin battery only
Approx. NOK 1.400.000,-

All prices given above are cost estimates for budgetary purposes only and thus not binding for us.

We hope the above corresponds to your present requirements and look forward to hearing from you.

Yours faithfully,
for Elkem-Spigerverket a/s
Engineering Division

K. Bergwitz-Larsen

L. Grennes Hanssen

Copy: Elkem Technology Inc. New York

2025 6-79 Cicero a.s 5000

RCA JUN 06 04248
KAISENGS OAK A

18229A ESADM N
NO 544

JUNE 6, 1980 LGH/EKE/TO/P.5129

ATT.: MR. R.B. GREENWALT

SINAI MANGANESE SMELTER PLANT - ABU ZENEIMA PROJECT

WE REFER MEETING IN OUR OFFICE APRIL 16, 1980 AND TO OUR LETTER HOF APRIL 21, REGARDING THE ABOVE PROJECT AND ARE PLEASED TO SUBMIT OUR BUDGET COST ESTIMATE FOR:

1) REHABILITATION OF EXISTING 13,2 MVA ELKEM SMELTING FURNACE FOR FEMN AND PIG IRON COMPRISING THE FOLLOWING EQUIPMENT.

   1. ELECTRODE HOLDER ASSEMBLY WITH HYDRAULIC SLIPPING AND HOIST.
   2. (FURNACE COVER). GAS SEALS FOR ELECTRODES.
   3. (FURNACE BODY). LINING MATERIALS FOR FURNACE BODY EXCLUDING REFRACTORY BRICKS. FANS FOR COOLING OF FURNACE BOTTOM.

   4. TAPPING LAUNDERS.
   5. EQUIPMENT FOR TAP HOLE OPERATION.
   6. SMOKE HOOD WITH STACK.
   7. GAS CLEANING PLANT.
   8. SECONDARY CURRENT SUPPLY.
   9. FURNACE TRANSFORMERS.
   10. HIGH TENSION EQUIPMENT.

11. CONTROL AND REGULATING EQUIPMENT.
12. MOTOR CONTROL CENTER.
13. LADLES AND LADLE TILTER.
14. WATER COOLING EQUIPMENT.
15. ELECTRODE CASING WORKSHOP.
16. SPARE PARTS FOR APPROX. 2 YEARS.

APPROX. NOK 22.400.000,-

THE ABOVE PRICE INCLUDES PERTINENT ENGINEERING, GEES FOR KNOW HOW AND RIGHTS, PACKING FOR OVERSEAS TRANSPORT AND IS BASED UPON DELIVERY FOB EUROPEAN PORTS.

ESTIMATED CIF-COST IS APPROX. NOK 23.600.000,-

AN ESTIMATE FOR OUR EXPERT SERVICES CONNECTED TO ERECTION AND COMMISSIONING IS APPROX. NOK 700.000,-

AN ESTIMATE FOR THE ERECTION JOB OF THE ABOVE EQUIPMENT IS: APPROX. NOK 2.500.000,-

2) ONE 13.2 MVA ELKEM SMELTING FURNACE FOR FEMN AND PIG IRON COMPRISING THE FOLLOWING EQUIPMENT:

1. ELECTRODE HOLDER ASSEMBLY WITH HYDRAULIC SLIPPING AND HOIST.
2. FURNACE COVER.
3. FURNACE BODY.
4. TAPPING LAUNDERS.
5. EQUIPMENT FOR TAP HOLE OPERATION.
6. SMOKE HOOD WITH STACK.
7. CHARGING EQUIPMENT.
8. GAS CLEANING PLANT.
9. SECONDARY CURRENT SUPPLY.
10. FURNACE TRANSFORMERS.
11. HIGH TENSION EQUIPMENT.
12. CONTROL AND REGULATING EQUIPMENT.
13. MOTOR CONTROL CENTER.
14. LADLES AND LADLE TILTER.
15. WATER COOLING EQUIPMENT.

16. ROTARY KILN WITH BAG FILTER.
17. CRANE INT APPING BAY.
18. WEIGHING PLANT FOR RAW MATERIALS WITH STEEL BIN BATTERY.
19. ELECTRODE CASING WORKSHOP.
20. SPARE PARTS FOR APPROX. 2 YEARS.

APPROX. NOK 48.900.000,-

THE ABOVE PRICE IS BASED ON SAME CONDITIONS AS FOR ITEM 1.

ESTIMATED CIF-COST IS: APPROX. NOK 51.400.000,-

AN ESTIMATE FOR OUR EXPERT
SERVICES CONNECTED TO ERECTION
AND COMMISSIONING IS: APPROX. NOK 850.000,-

AN ESTIMATE FOR THE ERECTION
JOB OF THE ABOVE EQUIPMENT IS: APPROX. NOK 6.500.000,-

ITEM 16, 17 AND 18 (BIN BATTERY ONLY) ARE INCLUDED IN THE ABOVE AMOUNT OF NOK 48,9 MILLS. WITH THE FOLLOWING PRICES:

ITEM 16. ROTARY KILN WITH BAG FILTER
APPROX. NOK 16.300.000,-

ITEM 17. CRANE IN TAPPING BAY
APPROX. NOK 3.300.000,-

ITEM 18. WEIGHING PLANT. BIN BATTERY ONLY
APPROX. NOK 1.400.000,-

ALL PRICES GIVEN ABOVE ARE COST ESTIMATES FOR BUDGETARY PURPOSES ONLY AND THUS NOT BINDING FOR US.

WE HOPE THE ABOVE CORRESPONDS TO YOUR PRESENT REQUIREMENTS AND LOOK FORWARD TO HEARING FROM YOU.

K. BERGWITZ-LARSEN / L. GRENNES HANSSEN ELKEM-SPIGERVERKET A/S

RCA JUN 06 042445
KAISENGS OAK A

18229A ESADM N
NO 544

JUNE 6, 1980 LGH/EKE/TO/P.5129

ATT.: MR. R.B. GREENWALT

SINAI MANGANESE SMELTER PLANT - ABU ZENEIMA PROJECT

WE REFER MEETING IN OUR OFFICE APRIL 16, 1980 AND TO OUR LETTER NOF APRIL 21, REGARDING THE ABOVE PROJECT AND ARE PLEASED TO SUBMIT OUR BUDGET COST ESTIMATE FOR:

1) REHABILITATION OF EXISTING 13,2 MVA ELKEM SMELTING FURNACE FOR FEMN AND PIG IRON COMPRISING THE FOLLOWING EQUIPMENT.

1. ELECTRODE HOLDER ASSEMBLY WITH HYDRAULIC SLIPPING AND HOIST.
2. (FURNACE COVER). GAS SEALS FOR ELECTRODES.
3. (FURNACE BODY). LINING MATERIALS FOR FURNACE BODY EXCLUDING REFRACTORY BRICKS. FANS FOR COOLING OF FURNACE BOTTOM.
4. TAPPING LAUNDERS.
5. EQUIPMENT FOR TAP HOLE OPERATION.
6. SMOKE HOOD WITH STACK.
7. GAS CLEANING PLANT.
8. SECONDARY CURRENT SUPPLY.
9. FURNACE TRANSFORMERS.
10. HIGH TENSION EQUIPMENT.

11. CONTROL AND REGULATING EQUIPMENT.
12. MOTOR CONTROL CENTER.
13. LADLES AND LADLE TILTER.
14. WATER COOLING EQUIPMENT.
15. ELECTRODE CASING WORKSHOP.
16. SPARE PARTS FOR APPROX. 2 YEARS.

6/6/80
4.8725 NoKr = 1 US$

APPROX. NOK 22.400.000,- 4597000

THE ABOVE PRICE INCLUDES PERTINENT ENGINEERING, FEES FOR KNOW HOW AND RIGHTS, PACKING FOR OVERSEAS TRANSPORT AND IS BASED UPON DELIVERY FOB EUROPEAN PORTS.

(247000)

ESTIMATED CIF-COST IS APPROX. NOK 23.600.000,- 4844000

AN ESTIMATE FOR OUR EXPERT SERVICES CONNECTED TO ERECTION AND COMMISSIONING IS APPROX. NOK 700.000,- 144000

AN ESTIMATE FOR THE ERECTION JOB OF THE ABOVE EQUIPMENT IS: APPROX. NOK 2.500.000,- 513000

5501000

2) ONE 13.2 MVA ELKEM SMELTING FURNACE FOR FERRO AND PIG IRON COMPRISING THE FOLLOWING EQUIPMENT:

1. ELECTRODE HOLDER ASSEMBLY WITH HYDRAULIC SLIPPING AND HOIST.
2. FURNACE COVER.
3. FURNACE BODY.
4. TAPPING LAUNDERS.
5. EQUIPMENT FOR TAP HOLE OPERATION.
6. SMOKE HOOD WITH STACK.
7. CHARGING EQUIPMENT.
8. GAS CLEANING PLANT.
9. SECONDARY CURRENT SUPPLY.
10. FURNACE TRANSFORMERS.
11. HIGH TENSION EQUIPMENT.
12. CONTROL AND REGULATING EQUIPMENT.
13. MOTOR CONTROL CENTER.
14. LADLES AND LADLE TILTER.
15. WATER COOLING EQUIPMENT.

. ROTARY KILN WITH BAG FILTER.

. CRANE INTAPPING BAY.

. WEIGHING PLANT FOR RAW MATERIALS WITH STEEL BIN BATTERY.

19. ELECTRODE CASING WORKSHOP.

20. SPARE PARTS FOR APPROX. 2 YEARS.

	APPROX. NOK 48.000.000,-	10036000
		- 4309000
	SAEF ONLY	5727000
	FRT	247000
THE ABOVE PRICE IS BASED ON SAME CONDITIONS AS FOR ITEM	FRHT SHIP	144000
		513000
		6631000
ESTIMATED CIF-COST IS:	APPROX. NOK 51.400.000,-	10549000
AN ESTIMATE FOR OUR EXPERT SERVICES CONNECTED TO ERECTION AND COMMISSIONING IS:	APPROX. NOK 850.000,-	174000
AN ESTIMATE FOR THE ERECTION JOB OF THE ABOVE EQUIPMENT IS:	APPROX. NOK 6.500.000,-	1334000

12057000

ITEM 16, 17 AND 18 (BIN BATTERY ONLY) ARE INCLUDED IN THE ABOVE AMOUNT OF NOK 48,9 MILLS. WITH THE FOLLOWING PRICES: 10 036 000

ITEM 16. ROTARY KILN WITH BAG FILTER

APPROX. NOK 16.300.000,- 3 345 000

ITEM 17. CRANE IN TAPPING BAY

APPROX. NOK 3.300.000,- 677 000

ITEM 18. WEIGHING PLANT. BIN BATTERY ONLY

APPROX. NOK 1.400.000,- 287 000

4 309 000

ALL PRICES GIVEN ABOVE ARE COST ESTIMATES FOR BUDGETARY PURPOSES ONLY AND THUS NOT BINDING FOR US.

WE HOPE THE ABOVE CORRESPONDS TO YOUR PRESENT REQUIREMENTS AND LOOK FORWARD TO HEARING FROM YOU.

K. BERGWITZ-LARSEN / L. GRENNES HANSSEN ELKEM-SPIGERVERKET A/S

18229A ESADD NP
KAISENGS GAR A

521
941
orig. 692.0

$1 US = 5.15 NorKr

1 350

18229B ESADM N

APRIL 2, 1980 LGH/EKE/TO/0.1226

ATT.: MR. R.B. GREENWALT

SINAI SMELTER PLANT AT ABU ZENEIMA

WE REFER TO YOUR TELEXES OF MARCH 26 AND 30, 1980 AND UNDERSTAND THAT YOU ARE IN NEED OF IMMEDIATE INFORMATION AND COST ESTIMATES FOR YOUR PROJECTS. ON A PRELIMINARY BASIS, PRIOR TO DISCUSSIONS TO COME LATER ON THIS MONTH, WE MAY ANSWER AS FOLLOWS:

1) RE YOUR TELEX OF MARCH 26, ITEM A.

COST ESTIMATE FOR COMPLETION AND REHABILITATION OF THE ELKEM FURNACE (RE ITEM NO. 1-10 AND NO. 14 IN OUR TECH. INSPECTION REPORT OF NOV. 76)

COMPRISING:

ELECTRODE HOISTS
ELECTRODE HOLDERS
FURNACE COVER
FURNACE BODY
TAPPING LAUNDERS
EQUIPMENT FOR TAP HOLE OPERATION
SMOKE HOOD WITH STACK
CHARGING EQUIPMENT
GAS CLEANING PLANT
SECONDARY CURRENT SUPPLY
FURNACE TRANSFORMER
HIGH TENSION EQUIPMENT
MEASURING INSTRUMENTS AND ELECTRODE REGULATORS
MISCELLANEOUS EQUIPMENT
SPARE PARTS

PRICE APPROX. NOK 14,5 MILL. 2.82 M$US

THE PRICE IS A PRELIMINARY, ROUGH ESTIMATION ONLY, NOT BINDING FOR US AND BASED UPON DELIVERY FOB EUROPEAN PORTS.

2) RE YOUR TELEXES OF MARCH 26, ITEM B, AND MARCH 30, ITEM B.

COST ESTIMATE FOR A SMELTER PLANT EXPANSION WITH ROTARY KILN AND 13,2 MVA ELKEM SMELTING FURNACE FOR FERROMANGANESE:

COMPRISING:

GENERAL PROJECT COSTS
RAW MATERIAL HANDLING SYSTEM
ROTARY KILN PLANT
CHARGE HANDLING SYSTEM
SMELTING PLANT
PRODUCT HANDLING SYSTEM
GAS CLEANING PLANT
LIFTING GEAR
INDUSTRIAL AND COOLING WATER SYSTEM
FUEL OIL SYSTEM
MACHINE TOOLS AND VEHICLES
ELECTRIJFICATION
INSTRUMENTATION
PIPING
SITE PREPARATION AND PROVISIONAL WORK
PLANT AREA CONSTRUCTIONS
FRESH WATER DISTRIBUTION SYSTEM
PROCESS BUILDING
SPARE PARTS
CONTINGENCIES

PRICE APPROX. NOK 145,0 MILL. 28.21.90

THE PRICE IS A PRELIMINARY ROUGH ESTIMATION ONLY AND NOT BINDING FOR US.

3) RE YOUR TELEX OF MARCH 30, ITEM A.

ELECTRICAL CHARACTERISTICS FOR THE 13,2 MVA ELKEM FURNACE

TRANSFORMER CAPACITY: 13.200 KVA
SECONDARY VOLTAGE RANGE: 90-130-210 VOLTS

APPROX. MAX. ELECTRODE CURRENT: 60.000 A.
MAX. FURNACE LOAD: 9000-10000 KW.

FURNACE OEPRATION

AFTER THE FURNACE HAS BEEN SWITCHED ON, THE LOAD WILL SLOWLY BE INCREASED WITHIN EIGHT DAYS FROM ABOUT 1000 KW TO ABOUT 3500 KW. DURING THIS FERIOD THE BAKING OF THE ELECTRODES AND THE DRYING OUT OF THE FURNACE LINING TAKE PLACE. AFTER 8 DAYS AND AN ACCUMULATED KWH-LOAD OF APPROX. 400.000, THE FURNACE IS GRADUALLY FILLED UP WITH RAW MATERIALS. THE FIRST TAPPING MAY TAKE PLACE AFTER 10-11 DAYS WITH APPROX. 700.000 KWH ACCUMULATED. AFTER ABOUT 16 DAYS THE FURNACE IS COMPLETELY FILLED UP, REGULAR AND STABLE TAPFINGS ARE ESTABLISHED AND THE FURNACE LOAD HAS REACHED THE ESTIMATED MAX. OF 9-10.000 KWH. ONLY MINOR CURRENT VARIATIONS OF SAY +- 10 0/0 ARE EXPECTED AFTER OPTIMUM ELECTRICAL CONDITIONS ARE ESTABLISHED.

ANNUAL OPERATING TIME FIGURE IS APPROX. 96 0/0. ROUTINE MEASUREMENTS OF ELECTRODE LENGTH MAY TAKE PLACE ONCE A WEEK WITH THE FURNACE SWITCHED OFF FOR 30-60 MINUTES.

PROGRIAMMED MAIN OVERHAUL MAY AMOUNT TO 1-2 WEEKS PER YEAR. RELINING OF THE FURNACE POT MAY BE NECESSARY AFTER 6-8 YEARS OF OPERATION AND REQUIRE NORMALLY ABOUT 1 MONTH.

BEST REGARDS,

V. OLDERHEIM / L. GRENNES HANSSEN ELKEM-SPIGERVERKET A/S

JFS
ACB
R. Greenwalt ✓
F. Coope
Oakland

18229B ESADM NØ

OPEN-TOP

MDUSA NYK

KAISENGS OAK A

KAISER ENGINEERS, OAKLAND, CA

ATT: MR. RICHARD GREENWALT

MDUSA NEWYORK TELEX 61.626 6 AUG. 1980

RE.: KAISER ENG (KE JOB 0012) FEE SIGAI

YOUR TELEX NO. 61.592, DATED 07.29.80

1. BUDGET PRICE FOR COMPLETE 13,[illegible] FURNACE INCLUDING THE FOLLOWING EQUIPMENT

- FURNACE SHELL INCLUDING REFRACTORY MATERIAL
- TAPPING EQUIPMENT
- GAS HOOD AND STACKS
- FURNACE CHARGING EQUIPMENT
- ELECTRODE COLUMNS
- HYDRAULIC PLANT
- HIGH CURRENT SUPPLY SYSTEM

- FURNACE TRANSFORMER

- FURNACE CONTROL SYSTEM AND ELECTRODE-REGULATION

- HIGH TENSION SWITCH GEAR

- COOLING WATER EQUIPMENT (PIPING AND DISTRIBUTOR)

- ELECTRODE CASING WORKSHOP

- BAG FILTER INSTALLATION

NON BINDING BUDGET PRICE APPROX. DM 7.500.000,--
$4 237 290
@ 1.770M=1$US

FOR ADDITIONAL COSTS OF SPARE PARTS, FREIGHT, EXECUTION AND COMMISSIONING PLEASE TAKE REFERENCE TO OUR TELEX NO. 61.487, DATED 06.30.1980.

2. DEMAG PERSONNEL TO THE JOB SITE

FOR RENDERING THREE SPECIAL ENGINEERS FOR VISITING THE JOB SITE IN SINAI WE CAN GIVE THE FOLLOWING RATES, WHICH ARE BASED ON TODAYS COSTS AND ARE TO BE UNDERSTOOD PER MAN AND CALENDER DAY ON A BASIS OF A 40 HOUR WORKING WEEK.

A) DAILY RATE DM 505,--
B) DAILY ALLOWANCE DM 100,--

IN ADDITION, THE TRAVEL EXPENSES HAVE TO BE PAID.

IF K.E. PLACES THE ORDER FOR THE ABOVE PROJECT, THE COSTS FOR THE DEMAG PERSONNEL WILL BE ABSORBED IN THE TOTAL COST OF THE PROJECT.

SINCERELY,
MANNESMANN DEMAG CORP.
B. ORR

MDUSA NYK

947 cc AAN
692.D JFS
542 GFC
DFB
RBG
FILE ✓

REPLY VIA WUI-DIAL 101 OR 301
✠
KAISENGS OAK A
KAISER ENGINEERS, OAKLAND, CA

MDUSA NEWYORK TELEX 61.487 30 JUNE 1980

ATTN: MR. RICHARD GREENWALT

REF: KAISER ENGINEERS FEMN, SINAI
(KE JOB 80012)

CONFIRMING OUR TELEPHONE CONVERSATION OF FRIDAY, WE WISH TO OFFER YOU THE FOLLOWING BUDGETARY PRICE QUOTATION FOR THE ABOVE PROJECT. THE ALTERNATIVES ARE BASED ON YOUR TELEX, DATED 6/10/80..

ALTERNATIVE ONE:

REHABILITATION OF 13,2 MW FURNACE EQUIPMENT AS FOLLOWS: COMPL. ELECTRODE COLUMNS INCL. SECONDARY CURRENT SUPPLY AND TRANSFORMER, GAS HOOD IN OPEN DESIGN, TAPPING EQUIPMENT, ELECTRICAL EQUIPMENT, COOLING WATER EQUIPMENT (PIPING AND DISTRIBUTOR) ELECTRODE CASING, WORKSHOP,. COMPL. BAG FILTER INSTALLATION.

BUDGET PRICE: APPROX. DM 5.500.000,-

FOR SPARE PARTS	ADD	APPROX.	5 0/0
FOR FREIGHT COSTS	ADD	''	3 0/0
FOR ERECTION	ADD	''	15-20 0/0
FOR SUPERVISION OF ERECTION AND COMMISSIONING	ADD	''	5-10 0/0

ALTERNATIVE TWO:

NEW 26,4 MVA FEMN FURNACE WITHIN THE LIMITS FROM THE TOP OF THE FURNACE CHARGING BINS AND TO THE BOTTOM OF THE TAPPING LAUNDERS, INCL. BAG FILTER INSTALLATION.

BUDGET PRICE: APPROX. DM 9,500,000,--

ADD APPROX. THE SAME PERCENTAGE VALUES AS ABOVE.

ALTERNATIVE THREE:

A 26,4 MVA FEMN TURN-KEY INSTALLATION INCLUDING ALTERNATIVE TWO, RAW MATERIAL HANDLING, CASTING EQUIPMENT, PRODUCT HANDLING, ELECTRIC POWER SYSTEM LABORATORY, WORKSHOP, MAGAZINE, BUILDINGS, FOUNDATION, ALL CIVIL WORK INSIDE THE PLANT, SPARE PARTS, TRANSPORTATION COSTS, ERECTION AND START UP SUPVERVISION

BUDGET- PRICE: APPROX. DM 20,000,000,-

FOR ALTERNATIVE 1 (ONE) IT SEEMS ABSOLUTELY NECESSARY TO EXAMINE THE JOB SITE TO CHECK THE APPLICABILITY OF THE EXISTING EQUIPMENT, BEFORE WORKING OUT A DETAILED QUOTATION.

ELECTRIC ARC FURNACE FOR THE PRODUCTION OF SEMI-STEEL

10 MVA (20-25 TON CAPACITY)

TODAY'S COST, WITHOUT ERECTION AND COMMISSIONING
PRICE: DM 2,500,000,- (EXCHANGE RATE APPROX.
US DOLLAR 1 ; 1.77 DM)

FOB NORTHSEA PORT, SEAWORTHY PACKING

PAYMENT: PROGRESS

DELIVERY: 12-14 MONTHS (DETERMINED BY TRANSFORMER - LONGEST LEAD TIME ITEM).

THIS DELIVERY APPLIES TO THE PROJECT IN GENERAL EXCEPT THE REHABILITATION OF EXISTING FACILITIES WHICH CAN ONLY BE DETERMINED AFTER SITE VISITATION.

BUDGET PRICE FOR ERECTION: 12-15 PERCENT OF ABOVE.

FREIGHT: APPROX. 1 -2 PERCENT OF ABOVE

WE HOPE THAT THE ABOVE INFORMATION IS SUFFICIENT FOR YOU AT THIS TIME. IF YOU NEED MORE INFORMATION PLEASE CONTACT US.

REGARDS,
B. ORR
MANNESMANN DEMAG CORPORATION

CC: DR. ROTTMANN - DEPT. 6321
MR. FELDMAN - DEPT. 6327-1

USA DMG

MDUSA NYK

REPLY VIA WUI-DIAL 101 OR 301

KAISER ENGINEERS OAK A
KAISER ENGINEERS, OAKLAND, CA

MDUSA NEWYORK TELEX 61.487 30 JUNE 19..

ATTN: DR. RICHARD GREENWALT

REF: KAISER ENGINEERS FEMN, SINAI
(FE JOB 80012)

CONFIRMING OUR TELEPHONE CONVERSATION OF FRIDAY, WE WISH TO OFFER YOU THE FOLLOWING BUDGETARY PRICE QUOTATION FOR THE ABOVE PROJECT. THE ALTERNATIVES ARE BASED ON YOUR TELEX, DATED 6/12/8..

[illegible] ATTACHED [illegible] FOR [illegible] EQUIPMENT AS FOLLOWS: COMPL. ELECTRODE COLUMNS INCL. SECONDARY SUPPLY AND TRANSFORMER, SAMPLING IN STEN DESIGN, [illegible] EQUIPMENT, ELECTRICAL EQUIPMENT, COOLING WATER EQUIPMENT (PIPING AND DISTRIBUTOR) ELECTRODE COLUMN, WORKSHOP,. COMPL. BAG FILTER INSTALLATION.

1.770M = 1800

BUDGET PRICE: APPROX. DM 5.500.000,- $3107345

FOR SPARE PARTS	ADD	APPROX.	5 O/O	482780
OF PROJECT COSTS	ADD	"	3 O/O	93280
FOR ERECTION	ADD	"	1-[illegible] O/O	621469
FOR SUPERVISION OF ERECTION AND COMMISSIONING	ADD	"	5-1[illegible] O/O	310734
				$4615542

[illegible]

DELIVERY: 12-14 MONTHS (DETERMINED BY THE GRINDER LONGEST LEAD TIME ITEM).

THIS DELIVERY APPLIES TO THE PROJECT IN GENERAL EXCEPT THE REHABILITATION OF EXISTING FACILITIES WHICH CAN ONLY BE DETERMINED AFTER SITE VISITATION.

BUDGET PRICE FOR ERECTION: 12-15 PERCENT OF ABOVE. 211869

FREIGHT: APPROX. 1 -2 PERCENT OF ABOVE 28247

TOTAL $1652542

WE HOPE THAT THE ABOVE INFORMATION IS SUFFICIENT FOR YOU AT THIS TIME. IF YOU NEED MORE INFORMATION PLEASE CONTACT US.

REGARDS,
J. CRI
BARNES ANN DEMAG CORPORATION

MR. FELDMAN - DE-I. 6307-1

USA DMG

MDUSA NYK

[illegible] 20,4 MVA FEMN FURNACE WITHIN THE LIMITS FROM THE TOP OF THE FURNACE CHARGING BELT AND TO THE BOTTOM OF THE TAPPING LAUNDERS, INCL. BAG FILTER INSTALLATION.

BUDGET PRICE: APPROX. DM 9.500.000,-- $ 5 367 232

ADD APPROX. THE SAME PERCENTAGE VALUES AS ABOVE. 2039 548

TOTAL $ 7 406 780

ALTERNATIVE THREE:

A [illegible] ,4 [illegible] INSTALLATION INCLUDING ALTERNATIVE TWO, RAW MATERIAL HANDLING, CASTING EQUIPMENT, PRODUCT HANDLING, ELECTRIC POWER SYSTEM LABORATORY, WORKSHOP, MAGAZINE, BUILDINGS, FOUNDATION, ALL CIVIL WORK INSIDE THE PLANT, SPARE PARTS, TRANSPORTATION COSTS, ERECTION AND START UP SUPERVISION

~~BUDGET PRICE: APPROX. DM 20,000,000,-~~ $ 11 299 435

FOR ALTERNATIVE 1 (ONE) IT SEEMS ABSOLUTELY NECESSARY TO EXAMINE THE JOB SITE TO CHECK THE APPLICABILITY OF THE EXISTING EQUIPMENT, BEFORE WORKING OUT A DETAILED QUOTATION.

ELECTRIC ARC FURNACE FOR THE PRODUCTION OF [illegible]

---

10 MVA (20-25 TON CAPACITY)

TODAY'S COST, WITHOUT ERECTION AND COMMISSIONING PRICE: DM 2,500,000.- (EXCHANGE RATE APPROX. US DOLLAR 1 ; 1.77 DM) $ 1412 429

FOB NORTHSEA PORT, SEAWORTHY PACKING

PAYMENT: PROGRESS

QUOTATION FROM

C. H. BULL COMPANY
233 UTAH AVENUE
SOUTH SAN FRANCISCO, CA 94080

Representatives for YOUNG RADIATOR COMPANY

TO Kaiser Engineers E.D. 7
P.O. Box 23210
Oakland, CA 94623

DATE August 5, 1980

REFERENCE Syani Manganese

ATTENTION Mr. Dusty Boyd

QUOTATION B-394-0

Thank you for your inquiry to which we are pleased to respond with the following AIR COOLED HEAT EXCHANGER recommendation. Please advise if further information is required and continue to call us as your heat transfer needs occur.

DESIGN FOR			
Application	Furnace Cooling		
Rating			
Ambient Temperature	115 F	F	F
Site Elevation	500 feet	feet	feet
Heat Rejection Rate	145,708 Btu/min	Btu/min	Btu/min
Inlet Temperature	(90C) 194 F	F	F
Outlet Temperature	(70C) 158 F	F	F
Fluid	Water		
Flow Rate	500GPM		
Pressure Loss	9.0 psi	psi	psi
RECOMMENDATION			
Model	HC2212		
Motor HP/Type	(2) 50 hp/TEFC	hp/	hp/
Motor Voltage, (60Hz)	3 Φ 460 V	Φ V	Φ V
Net Price Each	$ 53,000.00	$	$
Accessories			
Lot Size	1		
Shipping Weight	19,000 lb	lb	lb
Stock Available	20 Weeks		
Shipping Point	Mattoon, IL		

Terms

Prices quoted are F.O.B. shipping point and are subject to regular terms of 30 days net on approved credit. Product is covered by our standard guarantee. Prices are firm for acceptance within 30 days of quotation date and shipment within 120 days of order receipt date. Later shipments will be subject to prices reflecting then current labor and material costs. Price does not include State, City Sales, or Use Tax to which this material may be subject. Lot prices quoted apply to quantities authorized by customer and accepted by Young Radiator Company for shipment at one time. Stocked items are subject to prior sale. Leadtime indicates period after receipt of order or drawing approval if required.

Encl: 575

Quoted By Ronald J. Mac Quarrie

Signature Ronald J. Mac Quarrie

CC: Young Radiator Company Industrial Division

YOUNG RADIATOR COMPANY

2825 Four Mile Road Racine, Wisconsin 53404

Plants at: Racine, WI, Mattoon, IL and Centerville, IA

Young Quality

شركة كلوكنر - إينا مصر شركة ذات مسئولية محدودة
٣٧ شارع عبد الخالق ثروت - القاهرة
رأس المال: ١٠٠٠٠ جم

542
692.D
947

KLÖCKNER

INA EGYPT LTD

KLÖCKNER INA EGYPT LTD, P. O. Box 2218, Cairo/Egypt

37, Abdel Khalek Sarwat Street
Cairo/Egypt
P. O. Box 2218
Telephone. 933979-930150
Telex. 92438 INA UN
Telegramme: klocknerina cairo

ARAB CONSULTING BUREAU
2, Mohamed Sabry Abu-Alam
Cairo

Attn.: Mr. Lonir El-Kholy

Your letter of	Your reference	Our reference	Cairo
		Ku/n	27.5.1980

Ref.: Ferro Manganese

Dear Mr. El-Kholy,

We checked with our head-office in Heilbronn, if they are able to supply equipment for the production of Ferro-Manganese.

Their reply was positive and we attach herewith the short list of the necessary equipment with a budget price.

We hope that this information is of interest to you and remain

yours sincerely
KLÖCKNER-INA EGYPT Ltd.

D. Kuhn

Encl.

Cc - J.F. Sulzbach
- D. Neumann
- F. Coope
- R.B. Greenwalt
- G. Aiken
- File

c.c.: KE

Ofcn

Budget Price for a Turn-Key Plant to produce approx. 20.000 jato H.C. FeMn/Egypt

1. List of Equipment and Services

1.1 raw material unloading system
" storage yard system
" handling equipment

1.2 FeMn-furnace
Casting equipment
Casting hall equipment

1.3 Product handling equipment
Water supply system
Compressed air system

1.4 Electric power system

1.5 Laboratory
Workshop
Magazine
Spare-Parts

1.6 Transport costs
Erection, supervision
Start-up "

.../2

1.7 Building
Foundation
and all other civil work
inside FeMn-Plant

1.8 Engineering

2. Price

The Budget Price for a Turn-Key Plant of this size will be approx. DM 20 Mio.
The price is a budget only and is based on the present equipment cost. Cash price, duties, taxes and transport costs are excluded.

cc JFS
GFC
FILE

KAISENGS OAK A

WU INFOMASTER 1-006716C224003 08/11/80
TLX ALISCHA WLIS A
ZCZC 043 MILWAUKEE WIS 8 AUG 80 5334
TLX 335326 KAISENGS OAK A
ATTN DICK GREENWALT
BT

RE: SINAI MANGANESE PROJECT

1. ESTIMATE FOR A 65,000 TPY REDUCTION FACILITY:

INCLUDING: FEEDERS
OH GAS CLEANING EQUIPMENT
I.D. FAN
COMBUSTION EQUIPMENT
BATTERY LIMIT DOES NOT INCLUDE RAW FEED STORAGE OR PRODUCT LOADOUT EQUIPMENT
$11.1 MILLION ERECTED U.S.
$7.2 EQUIPMENT AND SERVICES

2. I HOPE THIS INFORMATION SATISFIES YOUR REQUEST.

BEST REGARDS,

DICK NIGH/D RIERSON, ALLIS CHALMERS CORP., TLX 269441

NNNN
1040 EST
KAISENGS OAK A

cc CHS
GSC
MH
FILE

KAISENGS OAK A

WU INFOMASTER 1-006716C224003 08/11/80
TLX ALISCHA WLIS A
ZCZC 043 MILWAUKEE WIS 8 AUG 80 5334
TLX 335326 KAISENGS OAK A
ATTN DICK GREENWALT
BT

RE: SINAI MANGANESE PROJECT

1. ESTIMATE FOR A 65,000 TPY REDUCTION FACILITY:
REACTOR SIZE 3m Ø x 50m.
COOLER SIZE: 2½m Ø x 40m.

INCLUDING: FEEDERS
OH GAS CLEANING EQUIPMENT
I.D. FAN
COMBUSTION EQUIPMENT

BATTERY LIMIT DOES NOT INCLUDE RAW FEED STORAGE OR PRODUCT LOADOUT EQUIPMENT
$11.1 MILLION ERECTED U.S.
$7.2 EQUIPMENT AND SERVICES

2. I HOPE THIS INFORMATION SATISFIES YOUR REQUEST.

BEST REGARDS,

DICK NIGH/D RIERSON, ALLIS CHALMERS CORP., TLX 269441

NNNN
1040 EST

KAISENGS OAK A

KRESS CORPORATION

June 30, 1980

KAISER ENGINEERS INC.
Box 23210
Oakland, CA 94623

ATTN: Mr. Boyd/ED-4

Dear Mr. Boyd:

We appreciate your request for information for your Egyptian client. Enclosed you will find brochures which are self-explanatory.

Since each slag tap will generate $4m^3$ of slag, we would suggest approximately a $5.3m^3$ slag pot which would carry the slag with ample freeboard and allow for reasonable contingency. Our Model PE-70 would be recommended for this job.

Since the smelter is in a very poor state of repair being destroyed in the Israeli war and idle since that time, we suggest you consider the use of our carrier for charging your furnace, moving the raw materials and the product as well as the slag.

At Union Carbide in Marietta, Ohio we have load cells on our machines which allow the product to be weighed within one-half percent as well as moved by the machines.

If the high capital cost of cranes and crane supporting structures can be eliminated, the return on capital investment can be much more attractive. In addition, much more flexibility in the design of the plant can further reduce the capital cost as well as adding to the operating efficiency of the plan.

Our machine can operate very quickly. For instance, we could pick up, transport one kilometer, dump, return and set down a container, ladle or slag pot in as little time as 8 minutes. One carrier could be designed to fit a container, ladle and slag pot. With the purchase of three or the maximum of four carriers at $200,000, practially all your in-plant material handling needs could be satisfied

BOX 366 • BRIMFIELD, ILLINOIS 61517 • 309/446-3395 • TWX 910-651-4290

We would be more than pleased to work with you on this project. Please contact us if we can be of further assistance.

Sincerely,

KRESS CORPORATION

Edward S. Kress
President

ESK/rb

Enc: "SlagAway" brochure
written description
ad reprint
SX reprint
Hyd/Pneu reprint
(2) photographs (L-160/P-70)
Scrap Box brochure
carrier location listing

KRESS "SlagAway"

Slag Pot, Ladle and Container Carriers

The KRESS CORPORATION is the world's leading manufacturer of slag pot carriers. More than 175 Kress "SlagAway" Carriers have been delivered since the first carrier became operational in December of 1965. Throughout the world, electric furnace and basic oxygen plants are converting from rail-car pot carrying and pit digging to "SlagAway" Carriers. Copper, nickel and phosphorous smelters are also converting to these carriers. The majority of new B.O.F. plants in North America use Kress Carriers for slag handling.

These machine are uniquely productive. A pot can be picked up off the ground or off a comparably designed transfer car, transported 1 km (.6 miles), poured, skulled and returned to the mill in less than ten minutes. Quick handling of slag and segregated skulls greatly reduces the cost of metallic recovery. With the complete cycle using so little time, other uses for the machine can be found — such as moving raw material, general mill debris, precipitator dust, flue dust, mill scale, scrap and crop-ends, etc., in special containers or extra pots. There is no longer a need for trucks waiting to be loaded. The self-loading carriers pick up full containers, thus saving valuable time.

Not only do the carriers show substantial economic savings in the handling and processing of slag, but their major contribution is made by improving the overall plant operating efficiency. Excessive in-plant pot handling is eliminated when slag pits are removed. This saves valuable crane time and substantially reduces crane maintenance. In-plant pollution is reduced and space is saved along with the reduction of congestion in and about the plant. One nonferrous operator discontinued railroad pot handling and replaced 27 workers by converting to two "SlagAway" Carriers and six slag pots.

The same carrier that handles the pots and containers can easily pick up, transport, and tip empty hot metal and teeming ladles, thus allowing these ladles to be removed from the shop, tilted 90° and laid on a simple stand for clean out. This will permit an inexpensive building, without heavy cranes, to be used for refractory storage and ladle relining and repair.

Other versions of these carriers are now available to handle electric furnace scrap charging buckets. These carriers are able to pick up the scrap bucket from the ground and feature onboard load weighing systems.

The carriers have proven very reliable. They have carried approximately 6,000,000 pots and about 300,000,000 tons of slag since the first machine went into operation. At present, over 3,000 slag pots per day are being handled by Kress "SlagAways", not including many containers. The first machine is over 14 years old and has carried over 150,000 pots and is as mechanically sound as when it was purchased. Every operation that these carriers service works seven days a week, 24 hours a day. The final proof of the machines' reliability is that they have never caused a mill to lose production.

Since every slag pot to date has been different in size, shape and trunnion configuration, each machine is custom-designed. There are three basic types of pot holding arrangements: The single point, the double point, the triple point (sometimes referred to as trunnions). Basic designs for other arrangements are furnished as required.

Kress "SlagAway" Carriers are now available in two basic types: The original type with aircraft rear tires and the later type with earthmover rear tires. Each type is available in capacities ranging from 70,000# to 420,000# for a total of eleven different basic models. Whatever your particular job or needs, there will be a Kress Carrier model that is ideal for your application.

The carriers are extremely maneuverable. Model P-320 can make 180° non-stop turns in approximately 10m (33 ft.) aisles. This allows the carrier to work in very confined areas which can save valuable space inside the plant.

On the rare occasion when the pots are heavily laden with steel rather than slag, the maximum capacity of the carrier in pounds is the model number multiplied by 1,000.

MODEL	MAXIMUM LOAD		AVERAGE LOAD		MAX. POT VOL.	
P-70CS	32T	70,000#	21T	46,000#	4.2 M^3	150 $Ft.^3$
P-110CN	50T	110,000#	33T	73,000#	8.5	300
P-160N	96T	210,000#	64T	140,000#	14.0	500
P-220	100T	220,000#	67T	147,000#	14.0	500
P-320	145T	320,000#	97T	214,000#	20.0	700
P-420	190T	420,000#	127T	280,000#	31.0	1100
PE-70CS	32T	70,000#	21T	46,000#	4.2	150
PE-110C	50T	110,000#	33T	73,000#	8.5	300
PE-220	100T	220,000#	67T	147,000#	14.0	500
PE-320	145T	320,000#	97T	214,000#	20.0	700
PE-420	190T	420,000#	127T	280,000#	33.8	1200

Further studies will show you the many advantages of these carriers that will enable you to increase plant efficiency and productivity, and reduce operating costs.

KRESS CORPORATION
P O Box 368 • Brimfield, Illinois U S A 61517
Phone (309) 446-3395 TWX (910) 651-4290

cc: JFS
GEA
GFC
AAW

KAISENGS OAK A
VH
0519 EDT
KAISENGS OAK A
CAIRO 17/6/80
TLX NO: 514
ATT : GREENWALT
SUB : MINE MAPS AND STAGE 1 WORK REPORT

AAA- BREAK DOWN OF COST ESTIMATE FOR REHABILITATION OF SMELTER BUILDING AS FOLLOWS :-

PLATFORM	15000	LE
KILN FOUNDATION	30000	LE
METALIC ROOF STRUCTURE	25000	LE INCLUDING CLADDING
OTHERS	30000	LE
TOTAL	100000	LE

BBB- SHALL RECEIVE CHEMICAL ANALYSIS RESULTS FROM WCR SAT. 19 JULY 1980. SHALL TLX ORE RESERVES QUALITY ASA CALCULATED ABOUT 21/22 JULY.

CCC- THIRD ACB DRAFT WILL BE DHL 21 JULY INCLUDING LAST ACB INPUT " COMPLETE ANALYSES " APPENDICES.

BEST REGARDS,
KEVIN EL KHOLY
KAISENGS OAK A

REPLY VIA ITT 203 AND GET DOUBLED SAVINGS .

SOLAR TURBINES INTERNATIONAL

JUNE 17, 1980

KAISER ENGINEERS, INC.
P.O. BOX 23210
OAKLAND, CALIFORNIA 94623

ATTENTION: MR. G.F. COOPE

SUBJECT: SOLAR TURBINE GENERATOR SETS

DEAR MR. COOPE:

CONFIRMING YOUR DISCUSSIONS WITH MR. DAVE JORGENSEN, CONCERNING SOLAR MARS TURBINE GENERATOR SETS FOR A PROJECT IN EGYPT, WE ARE PLEASED TO PROVIDE PRICING FOR BUDGETARY PURPOSES. THE PRICE OF A MARS CONTINUOUS DUTY GENERATOR SET FOR THE SUBJECT SITE IS APPROXIMATELY - $2.2 MILLION, AND THE COST OF THE ASSOCIATED WASTE HEAT RECOVERY EQUIPMENT IS APPROXIMATELY - $250,000.

IT HAS BEEN OUR EXPERIENCE THAT THE TOTAL COST OF INSTALLING THIS TYPE OF EQUIPMENT IN THE PROPOSED LOCATION IS APPROXIMATELY EQUAL TO THE TURBO-MACHINERY HARDWARE COST.

WE TRUST THAT THIS COMPLETES THE INFORMATION YOU REQUIRE, BUT SHOULD YOU HAVE ANY FURTHER QUESTIONS, PLEASE DO NOT HESITATE TO CONTACT US.

YOURS VERY TRULY,

Thomas E. Kozlowski

THOMAS E. KOZLOWSKI,
SR. SALES ENGINEER

TEK:PO

Watergate Tower #1, 1900 Powell Street, Suite #335, Emeryville, CA 94608
Phone (415) 652-9333

SULZER BROS. INC., SAN FRANCISCO, CA 94109
WESTERN DISTRICT OFFICE

692.D

SULZER

Mailing Address:
1255 Post Street, Suite 911
San Francisco, CA 94109
Telephone: Area Code 415
441-7230

Cable Address: Sulwest
Telex: (WU) 34282

Kaiser Engineers
P.O. Box 23210
OAKLAND, CA 94623

Attn: Mr. G. F. Coope

Please quote our reference in correspondence and telephone calls

Your reference	Your letter of	Our reference	Date
		SED/sch	July 3, 1980

Re: Gas Turbine Generators for Egypt

Dear Sir:

I am referring to our recent telephone conversation and I am pleased to confirm the following information which I submitted to you for your feasibility study on a gas turbine generator with waste heat boiler project.

We would propose to use our gas turbine, type PRIMO 15, which is described and illustrated in the enclosed pamphlet which I recommend you read carefully. At ambient temperatures of 30°C and 41.5°C the power at the generator terminal would be 12 MW and 10.8 MW respectively. Above figures take into account installation at sealevel and air filtration for desert conditions. The price for one unit including gas turbine, gear, generator, engineering and installation would be $ 3 mio.

A waste heat boiler for above gas turbine would produce 40 t/h steam at 5 bar abs. (72.5 psia) and 160°C and would cost, including installation $ 1.7 mio.

Regarding maintenance please note that the meantime between overhauls of the gas generator can exceed 24000 hours of operation. To ensure absolute minimum downtime for maintenance and to save the installation of a second unit (to overcome maintenance shut-down periods) we could arrange that a rebuilt gas generator will be made available and installed for the time maintenance and rebuild work will be performed at your unit.

...

I shall be happy to provide you with any additional information which you may require.

Yours sincerely,
SULZER BROS. INC.

Edy O. Sennhauser

Enclosure:
pamphlets 21.30.10;
21.25.10.

INCOMING CABLE

TX from : BBC/Baden
Copy to

Our Ref
Date 14.5.80

692.D
951
542

P.L.	13 APR 1980	P.M.	
INV			

92200 BBC UNQ
15.590
92200 BBC UN
58762 BBCGT CH

BADENSVITZERLAND TELEX NR. 4Q106/5/ICV 80-05-12 15.41 ABE

ATTN. MR. R. ALEXAN
REF.: SINAI 1-3, ABU ZEINEMA

COST ASSESSMENT FOR SINAI 1-3 REHABILITATION:

BASED ON OUR MR. KESSLER'S SURVEY AND DAMAGE REPORT THE FOLLOWING COSTS HAVE BEEN CALCULATED

1) MATERIAL : APPROX SFR. 15'000'000.-

2) ERECTION, COMMISSIONING, TOOLS: SFR. 3'000'000.- 1 807 000

3) DAILY ALLOWANCES: EGYPT POUNDS 150'000.-

THE PRICE FOR THE MATERIAL INCLUDES SEATIGHT PACKING AND TRANSPORT FOB EUROPEAN PORT. THE FOLLOWING IS EXCLUDED: INSURANCE, CUSTOM DUTIES AND ANY OTHER TAXES OR FEES LEVIED IN THE COUNTRY OF DESTINATION.

THE FOLLOWING MATERIAL AND SERVICES ARE ALSO EXCLUDED: THE WASTE HEAT BOILER, THE DESALINATION PLANT AND ALL CIVIL WORKS.

IN CASE YOU NEED MORE DETAILS THE FOLLOWING ITEMS WILL HAVE TO BE CHECKED IN DETAIL BY ONE OF OUR SPECIALISTS:

- TURBOGENERATORS
- EXCITERS
- STARTING MOTORS

SINCE THE EFFICIENCY OF THE OLD UNITS IS RATHER SMALL WE THINK THAT THE FOLLOWING SOLUTION WOULD BETTER SERVE THE CUSTOMER'S NEEDS:

2 TYPE 9 GT'S
1 WASTE HEAT BOILER (WHB) WITH CONNECTION TO BOTH GT'S. GT'S WITH BYPASS-CHIMNEYS AND 3-WAY EXHAUST GAS VALVES, SO EITHER ONE OR THE OTHER GT CAN BE CONNECTED TO THE WHB. 1 WHB WOULD FOR THE MOMENT ALREADY BE MORE THAN ENOUGH TO SATISFY THE ACTUAL NEEDS. HOWEVER, WHEN BIGGER QUANTITIES OF STEAM WILL BE REQUIRED, A SECOND WHB CAN EASILY BE INSTALLED AND CONNECTED TO THE 2ND GT. THE OUTPUT OF A WHB COULD BE (EXAMPLE): 9, TO/H, 22 BAR.

THE BUDGET PRICE FOR THE TWO GT'S AND THE WASTE HEAT BOILER, INCLUDING THE CONNECTION DUCTS AND VALVES AS WELL AS ERECTION AND COMMISSIONING WOULD BE (DEPENDING ON SCOPE OF SUPPLY AND EXECUTION) APPROX. 21,5 MIO SFR. # 14 952 000
MATERIAL SEATIGHT PACKED AND DELIVERED CIF PORT OF DESTINATION.

TAXES, CUSTOMS DUTIES AND FEES OF ANY KIND ARE EXCLUDED.

WE HOPE THAT THIS INFORMATION WILL BE OF SERVICE TO YOU AND REMAIN AT YOUR DISPOSAL FOR FURTHER QUESTIONS YOU MAY HAVE.

REGARDS
BROWNBOVERI/GASTURBINES
ICV-11/ P. DAERFUSS

Oak.
F. Coope
R. Greenwalt
D. Neumann
File

92200 BBC UN
58762 BBCGT CH

BROWN BOVERI
CONSULTING OFFICE FOR EGYPT

692.D
951
542

INCOMING CABLE

TX from : TCV/Baden
Copy to

Our Ref.
Date 17.4.80

P.L. 19 APR 1980 P.L.

14.23
92288 BBC UN
56762 BBCGT CH

BADENSWITZERLAND TELEX NR. 4Q3QQ/4/TCV 8Q-Q4-17 13.QQ ABE

ATTN. MR. R. ALEXAN
REF. SINAI 1-3, ABU ZENIEMA, SR TX NO 951 OF 2-4-8Q

THANKS YR TX - PRICE FOR REHABILITATION OF POWER PLANT AND DESALINATION PLANT FOLLOWS, BUT PLEASE NOTE ALREADY: VERY HIGH SINCE HAVE TO PROVIDE LOTS OF REPLACEMENT PARTS WHICH DO NOT EXIST ANY MORE. SINCE EL. CAPACITY SHOULD BE INCREASED SHOULD ADD ONE UNIT OF APPROX. 11 TO 15 MW, OUR SMALLEST UNIT TYPE 9 HAS APPROX. 29 MW SITE RATING, TOTAL CAPACITY BEING THEN APPROX. 5Q MW PRICE FOR ONE TYPE 9 OUTDOOR INSTALLED AND COMMISSIONED IS APPROX. 6,5 MIO. SFR. (INCLUDING ALL REQUIRED AUXILIARIES). incl. [illegible]

32 MW

SINCE EFFICIENCY OF TYPE 9 MUCH HIGHER THAN OLD TYPE 1Q AND CONSIDERING POSSIBILITY OF DESALINATION CAPACITY INCREASE IN THE FUTURE, COULD ALSO IMAGINE TO INSTALL TWO TYPE 9 (INSTEAD OF TYPE 1Q REHABILITATION) ONE OF WHICH WOULD FOR THE MOMENT BE STAND-BY.

PLEASE COMMENT AND EXPLAIN YOURS AND CUSTOMER'S IDEAS.

REGARDS
BROWNBOVERI/GASTURBINES
TCV-11/P. BAERFUSS

1 swiss franc ~~1.65~~ 1.75 / $US
0,40 ~~0,40~~

92288 BBC UN
92288 BBC UN
56762 BBCG CHV

4,857 000
2 400
7,257

KAISER
ENGINEERS

KAISER ENGINEERS INC
300 LAKESIDE DRIVE
POST OFFICE BOX 23000
OAKLAND, CALIFORNIA 94604

August 29, 1980

Weir Westgarth Limited
Cathcart Glasgow G44 4EX
Scotland

Attention: Mr. W. R. Querns

Subject: Sinai Manganese Company - Reverse osmosis desalination plant

Gentlemen:

This is to confirm the conclusions reached during a meeting between Mr. Querns of Weir Westgarth and Messrs. R. J. Socolich and G. F. Coope of Kaiser Engineers in San Francisco on July 8, 1980. The fact that the 500,000 imp. gal/day plant originally forseen will probably not be necessary was brought up and the alternative, a smaller plant to produce 150,000 imp. gal/day was considered. Mr. Querns and Mr. Socolich were in agreement that with this reduced capacity it appears desirable to go to reverse osmosis, rather than the gas turbine waste heat boiler - flash distillation process which had been contemplated for the larger plant, because in this size range the energy saved by waste heat use does not compensate for the higher capital costs and the operating difficulties associated with the waste heat boiler - distillation system. Accordingly it was agreed that Mr. Querns would give Kaiser Engineers a preliminary budget estimate of the total cost of a 150,000 imp. gal./day reverse osmosis plant erected at Abu Zenima, based on present day prices and the experience accumulated in that area during the installation of the previous desalination plant at Abu Zeneina by Weir Westgarth. This budget estimate, which was later communicated to Mr. Socolich, was $ US 1,000,000 and includes skid mounted units with all necessary controls, instruments, internal piping, internal electrics and high presure pumps. As backup for the preliminary feasibility report we are submitting to the Sinai Manganese Company, we would appreciate written confirmation of this price and scope.

Very truly your,

KAISER ENGINEERS AND CONSTRUCTORS, INC.

G. F. Coope
Project Engineer

HYDRANAUTICS Water Systems

6333 Lindmar Drive
P.O. Box 3690
Santa Barbara, Ca. 93105

(805) 964-7747
Telex 658445 HYDRA GLTA

August 19, 1980

RECEIVED
AUG 21 1980
Kaiser Engineers
R. J. SOCOLICH

KAISER ENGINEERS
P.O. Box 23210
Oakland, CA 94623

Attention: Mr. Richard J. Socolich

Reference: Seawater Desalting by Reverse Osmosis

Dear Mr. Socolich:

Thank you for your inquiry regarding use of reverse osmosis to desalt seawater.

Confirming our telephone conversation, the capital costs of seawater R.O. equipment is about $3.00 to $4.00 per gallon of daily capacity. Thus, your requirement for 150,000 GPD would cost, ex factory, between $450,000 and $600,000. This price would include such items as acid and inhibitor injection, and cartridge filter pretreatment,but not any more extensive filtration, clarification, or floculation which could be necessary. Also, civil works would have to be added, as well as an adequate seawater intake system. Depending on the location for installation, and quality of the seawater, these other items could double the cost of the treatment facility.

I trust this will answer your questions. Thank you for your interest in Hydranautics Water Systems, and our line of reverse osmosis equipment.

Yours sincerely,

Rory O. Moore
Market manager, R.O. Systems

ROM:wh

20 August 1980

POLYMETRICS, INC.
SYSTEMS DIVISION

1005 TIMOTHY DRIVE • SAN JOSE, CALIFORNIA 95133 • 408/288-7850 • TELEX 346419 POLY SNJ

Kaiser Engineers
P. O. Box 23210
Oakland, CA 94623

Attention: Mr. Kirit Patel

Reference: 150,000 gpd Seawater Reverse Osmosis (RO) System for Ferro Manganeese Plant in Egypt.

Dear Sir:

We can supply a 150,000 gpd Seawater RO Plant for a total price of $535,000.00. This price is FOB, San Jose, California. The price is valid for 60 days. A system of this nature can be shipped approximately 12-16 weeks after receipt of order.

The equipment we plan to provide will consist of eight of our standard W30-VE05 seawater systems with a capacity of approximately 19,000 gpd each. Each of the W30-VE05 systems will consist of a one micron cartridge filter, a PolyStabilizer™ injection, a high pressure plunger pump, five DuPont B-10 permeators, a product water storage tank, a membrane cleaning kit and a control cabinet.

In order to disinfect the RO feed water, we will include a chlorination system. The chlorine is a strong oxidizing agent and will destroy the membranes if it is not removed. For this reason, we have also provided a sodium bisulfite injection system.

It is our recommendation that the feedwater for this system be taken from a well rather than a surface supply. We have found that well water is often free of turbidity and can be feed into the RO system without further pretreatment.

If the well water does have some turbidity or if the Silt Density Index of the feedwater is in excess of 3.0, then pretreatment media filters will be required. We can supply these filters for the total price add of $60,000.00.

If you have any questions regarding this system, or if you require a formal proposal, feel free to contact the undersigned.

RECEIVED
AUG 21 1980
KAISER ENGINEERS
Pollution Control
Dept.

POLYMETRICS, INC.
SYSTEMS DIVISION

We will also be willing to set up a meeting in Oakland to discuss this project at your convenience.

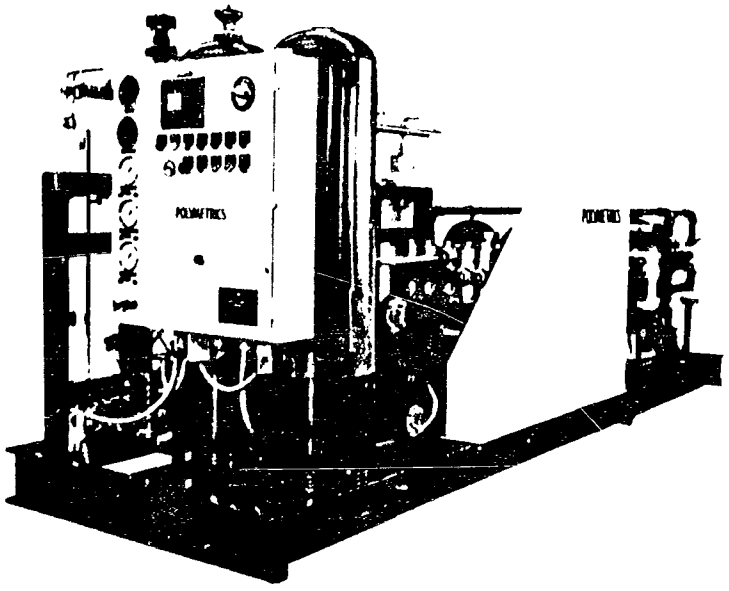
Best Regards,

Michael T. Brunelle

Michael T. Brunelle
Middle East Sales Representative

MTB/do
Enclosures

POLYMETRICS, INC.
SYSTEMS DIVISION



SEA WATER REVERSE OSMOSIS SYSTEMS

"W" Series

5,000 to 15,000 US gal/day
19 to 57 cubic meters/day

FEATURES

Operation

Produces potable water from seawater, utilizing single-pass, hollow fine fiber Reverse Osmosis technology.

Single control switch for instant start-up/stop of entire system.

Operation and maintenance are relatively simple—requiring daily check and routine maintenance.

Centralized instrument and control panel. All important operating parameters can be monitored and controlled from this panel.

Automatic shut-down when major fault occurs, with annunciation and visual display of cause.

Single chemical addition for control of scale. No acid addition is required.

No thermal or high salinity brine disposal problems.

System capacity can be increased easily in the field up to 15,000 gallons per day. Multiple units can be interconnected to give larger capacities.

Installation

All standard systems are supplied on welded steel skids. These skids are sandblasted and epoxy-painted to a marine specification. Skids are easily moved by forklift.

Installation requires only skid placement and connection of electrical and water lines.

All systems are factory-operated in an eight-hour test run to insure reliable performance of all components.

Corrosion Resistance

All high pressure manifolding, valves, tubing and fittings are constructed of 316 stainless steel. High velocities are maintained to avoid pitting and crevice corrosion.

Aluminum bronze is used in the fluid end of the high pressure pump. This alloy gives excellent service in seawater applications.

All wetted surfaces of the system are automatically flushed with fresh water upon shut-down.

All filtration equipment and permeator pressure vessels are constructed from Fiberglass Reinforced Plastic which is impervious to seawater corrosion.

All low pressure piping, valves and fittings are constructed from Sch. 80 PVC.

Stainless steel clamps and bolts are used throughout.

Maintenance

Designed-in accessibility of all components for ease of maintenance.

Easy-to-use system for cleaning the permeators.

Unattended operation—requires only daily check and log-taking.

Operating manuals contain maintenance program and trouble-shooting chart.

STANDARD EQUIPMENT

One-micron replaceable cartridge-type polishing filters in an FRP housing.

Positive displacement chemical injection pump for addition of scale inhibitor. Seven-day storage tank is equipped with a low level alarm.

High efficiency, quintuplex plunger pump used as a high pressure feed pump. An aluminum-bronze fluid end is used to minimize corrosion.

Electric motor driver with 1.15 service factor, severe duty corrosion resistant TEFC frame, Class F insulation.

NEMA 12 electrical enclosure with integral disconnect switch, full-voltage starter, heavy duty universal control transformer, control switches, status lights, and fault shut-down circuits.

DuPont Permasep®B-10 Reverse Osmosis permeators.

Pressure, temperature and level switches for system protection.

Panel-mounted, centrally located instruments, including product and concentrate flowmeters, liquid-filled pressure gauges, and product quality monitor.

Permeator cleaning kit.

Start-up kit containing test instruments, special tools, and a three-month supply of consumables.

OPTIONS AND ACCESSORIES

Separate skid-mounted pretreatment package including all necessary instrumentation and controls.
Feedwater intake pump skid.
Feedwater chlorination/dechlorination system.
Reduced-voltage pump starting.
Potable water chlorination system.
Potable water pumping system.
Spare parts inventory.
Storage tanks.
Explosion-proof electrical system for hazardous locations.
Special voltages.

OPERATING SPECIFICATIONS

Feedwater Temperature: Min: 39°F (4°C)
Max: 95°F (35°C)

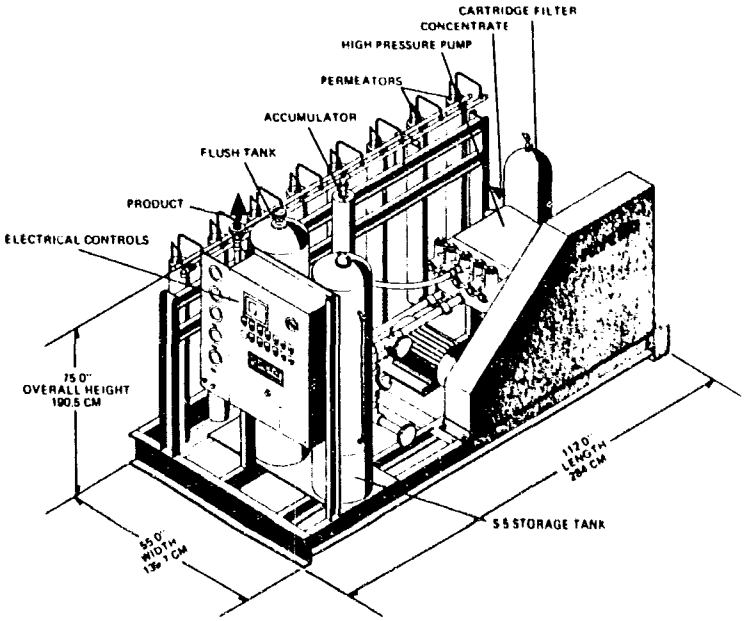
Feedwater Pressure (to Suction of High Pressure Pump): Min: 20 psig (1.4 kg/cm²), Max: 50 psig (3.5 kg/cm²)

Feedwater Salinity: Up to 40,000 mg/l total dissolved solids (consult POLYMETRICS for operation above this salinity)

Feedwater Suspended Solids: Silt Density Index (SDI) less than 3.0 (higher values may be acceptable, consult POLYMETRICS)

Pretreatment: Pretreatment selection will be made after reviewing feedwater conditions

Nominal Salt Passage: Less than 1.5%



Product Pressure: 0-20 psig (0.0-1.4 kg/cm²)

Recovery: 20-25%

Electrical: Three phase: 230/460V, 60 Hz or 380V, 50 Hz (other voltages are available as an option upon request)

Environment: Protection from direct exposure to sunlight; protection against temperature extremes, Max: 104°F (40°C), Min: 32°F (0°C)

Weight: 6000 pounds (2800 kg)

PHYSICAL SPECIFICATIONS

Model	Hi-Pres. Pump H.P.	Seawater Feed Requirement		Nominal Pure Water Output*		Power Consumption KWH 1000 Gal.
		US Gal/Min	Cubic Meters/Day	US Gal/Day	Cubic Meters/Day	
W20-FH05	20	17	93	5,000	19	46
W20-GH07	20	24	130	7,000	27	46
W30-ME03	30	31	170	9,000	34	46
W30-TE04	30	42	230	12,000	45	46
W30-VE05	30	44	240	15,000	57	39

*Nominal pure water output is based on feedwater supplied at 77°F (25°C) and with a salinity of 35,000 mg/l total dissolved solids. Flows are based on systems operating between 20-25% recovery and 800 psi. The pure water output will vary if feedwater is supplied at different temperatures or salinities. Consult POLYMETRICS for further information.

POLYMETRICS, INC.
SYSTEMS DIVISION

1005 Timothy Drive, San Jose, CA 95133 • Phone 408/288-7850 TWX 346419 POLY SNJ

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(Orig.)

9255 TELSTAR AVENUE • EL MONTE, CALIFORNIA 91731 • (213) 573-9220
TELEX 698706

June 20, 1980

Mr. G. F. Coope
Kaiser Engineers
P.O. Box 23210
Oakland, CA 94623

Dear Mr. Coope:

This letter is to explain and reiterate the cost figures we discussed on the phone June 17, 1980 to supply, erect, and commission a 600,000 gpd MSF desalination plant under consideration for Port Said.

There are many variables and complexities to consider to accurately estimate the cost of a turnkey MSF plant. Normally, many of these variables are specified before a project goes out for bid, thus defining more precisely the entire scope of work and equipment and facilitating a reasonably accurate cost estimate. The "luxury" of having this information is not yet available, so any cost figures we generate must be considered very preliminary and intended for general guidance only.

Per our phone conversation, the following assumptions shall apply to our price estimates:

1) One unit only @ 100% capacity = 600,000 gpd.
2) Provide "basic", functional system, appropriately controlled, which minimizes capital cost requirement.
3) Plant to be operated and maintained by local labor who must be trained to do this work.
4) Anticipate need for foreign labor for erection.
5) Scope of supply does not include sea water supply, steam or electric power generation, enclosed housing for electrical or control gear, or civil works.
6) Available steam = 75,000 lb/hr @ 120 psig saturated.

We believe that a first level approximation for the budget for such a plant can be estimated at $6 million, ±15%. This would be a simple, low temperature, once-through MSF plant with a performance ratio around 3. It would utilize 80-90% of the available steam and will have minimal capability to operate beyond the 600,000 gpd nominal capacity. The system will meet the minimal conventional practices for automatic control, and will occassionally require operator manual control to perform plant adjustments. Also, redundancies (eg. - for pumps) are minimal, so downtime will occur at those times when major process pumps are out of service.

The following breakdown of the $6 million figure may be helpful to you:

Item	Price	Explanation
a) Evaporator & Brine Heater	$2,400,000	Includes shell, tube bundles, waterboxes, internals, reinf. steel, etc.
b) Vacuum System	150,000	Hogging & ejectors.
c) Major Pumps	150,000	Includes one (each) blowdown, distillate, condensate, etc.
d) Electrical & Instrumentation	400,000	Includes control panels, instruments, cabling, switchgear, MCC's, control valves, etc.
e) Piping & Valves	200,000	
f) Dosing/Cleaning Systems	200,000	Anti-scale additives, acid cleaning system, sponge ball system, product water conditioning, etc.
g) Cranes/Steel	150,000	
h) Paint/Insulation	150,000	
i) Spare Parts	200,000	for 2 years
Total Supply	4,000,000	(FOB-Mfg. works)
j) Shipping	800,000	Incl. freight, fees, insurance, packing, etc. (approx. 20%)
k) Erection & Comm.	800,000	(approx. 160MM @ $5000/MM)
l) Design & Engineering	400,000	(approx. 10% of supply)-includes preparation of manuals, all engineering, etc.
Total Price	$6,000,000	

The price for this plant could conceivably rise to $11 million if the following were incorporated into the design:

1) A higher performance ratio (requiring more flash stages, but allowing for higher distillate production rate).
2) A heat reject section (which would reduce chemical operating costs).
3) Greater pump redundancies (ie - having 100% spare pumps on line).

4) More sophisticated control instrumentation (allowing full startup, shutdown and control from the control room).

5) Providing two identical ½ capacity MSF units (insuring water production even if one train is out of service).

6) Other modifications.

Assuming the plant owner desires that his operators and supervisors be professionally trained to run the plant, the cost would be approximately $15,000 to train each supervisor and $10,000 to train each operator. Thus, for a staff of 4 supervisors and 8 operators, the total charge for training would be in the neighborhood of $140,000.

We hope the price estimates and information presented here is sufficient for your budgetary projections. We shall be pleased to assist you at other future junctions in your efforts to define or provide an MSF (or other technology) desalination plant to serve your clients' requirements.

Sincerely,

Marvin Schlackman

Marvin I. Schlackman
Mgr. of Proposals

MIS:ar

Enclosures

PARTIAL MULTI-STAGE FLASH (MSF) INSTALLATION LIST

No.	Project Location	Size (MTD)	Year
1.	Bermudianna Hotel, Hamilton, Bermuda	100	1963
2.	Princess Hotel, Hamilton, Bermuda	375	1967
3.	Grapetree Bay Hotel, St. Croix, U.S.V.I.	375	1968
4	Virgin Island Power & Water, St. Thomas, U.S.V.I.	10,000	1969
5	Union Carbide Corp. Brownsville, Texas	1,100	1969
6	Brindisi #1, Italy*	2 @ 5,000	1969
7.	U.S.A. Corps of Engineers, Kwajalein, M.I.	950	1970
8.	Cape Verde, Cape Verde Islands*	2 @ 1,100	1970
9	Fuertaventura, Canary Islands*	2,000	1971
10.	Syros, Syros Island*	2,000	1971
11.	Princess Hotel, Southhampton, Bermuda	500	1971
12.	El Aiun, Spanish Sahara*	2 @ 3,500	1972
13	Lanzarote, Canary Islands*	2 @ 500	1973
14.	Brindisi #2, Italy*	10,000	1973
15.	Gela, Italy*	2 @ 14,000	1974
16	Arzew, Algeria	3 @ 1,100	1976
17.	Pertamina, Indonesia	2 @ 1,100	1976
18.	Lanzarote, MOP**	2 @ 2,500	1975
19	Ghubran Sultanate of Oman*	27,000	1976
20.	Las Palmas, Canary Islands*	2 @ 10,000	1977
21	Shannat, Libya*	3 @ 4,500	1978
22.	Bechtel for Sonatrach LNG I Algeria Phase II	2 @ 1,000	1977
23	Idda Naval Base, Saudi Arabia (U.S. Army Corps of Engineers)	2 @ 2,533	1979
24.	Idda Port Expansion, Saudi Arabia*	2 @ 2,265	1978
25.	Idda IV, Saudia Arabia	10 @ 22,000	1980-1982
26.	**Yanbu, Saudi Arabia**	**6 @ 10,000**	**1980–1983**

Background

Envirogenics Systems Company was organized in 1970. But it has the advantages of more than 57 years of experience in water purification and reclamation.

Envirogenics acquired the desalination operations of the Baldwin-Lime-Hamilton Corporation, which had previously acquired the pioneering water purification firm of The Griscom-Russell Company.

The acquisitions helped to complete a unique capability to conceive overall systems and to carry out detailed design and complete construction - to turnkey status - of a wide range of plant processes and sizes.

Headquarters of Envirogenics are in El Monte, California, U.S.A. Its operations are worldwide. Branch offices are located in the Netherlands, the Bahamas, Singapore, Abu Dhabi and Saudi Arabia.

Facilities at El Monte permit the company to manufacture many plant components and complete systems, and to carry on comprehensive design, research, development, test and demonstration programs. In addition, Envirogenics utilizes fabrication facilities local to the construction site wherever possible, to manufacture special process equipment to Envirogenics design.

Personnel at Envirogenics who will be assigned to any new project are specialists having extensive design, management and field experience in pilot plants and full size commercial plants. Key engineering personnel have had lead responsibility for development, design and turnkey construction programs.

Capabilities

Envirogenics offers a full range of support functions:

Engineering staff to assist in application and sales engineering, design, construction, start-up, operator training and plant operation.

Special engineering where existing designs are not applicable.

Research and development facilities to provide advanced technology permitting our customers to obtain the latest benefits of the state of the art.

Purchasing, expediting, inspection and field construction service in the U.S., Europe, Middle East, U.K. and South East Asia.

The company has successfully applied its technology to practice in more than 100 plants, either operating or under construction, in 18 countries, including over 45 in the last five years (14 MSF, 5 VTE, 1 VTE/MSF and 49 Reverse Osmosis plants). Our combined design and construction experience represents more than 160 million gallons per day of desalting capacity.

Investment in research, development, engineering, design and other product-development effort has totaled more than $22 million.

In distillation, $6 million has been funded to the company by U.S. government agencies and $4 million in company funds has been spent to advance Envirogenics' technology.

In Reverse Osmosis, over $9 million has been funded to the company by U.S. government agencies and $3 million in company funds has been spent to advance Envirogenics technology.

Competitive Techniques

Envirogenics Systems Company is carrying out a comprehensive program of developing and maintaining a strong position in the field of water purification. In addition to its own in-house research and development program, it includes licensing of technology from industry, continuous assimilation of technology resulting from government-sponsored research, and, as may be appropriate, acquisition of other organizations and their technology.

In MSF Distillation:

Envirogenics' extensive background in the design and manufacture of multi-stage flash equipment was gained through the acquisition of the Griscom-Russell and later the Baldwin-Lima-Hamilton desalting product line. The acquisition included 17 U.S. and 48 foreign patents in MSF technology, plus proven designs for both long-tube and cross-flow MSF plants in various sizes.

This experience began prior to World War I with marine distillation plants. By World War II The Griscom-Russell Company was the principal source of U.S. Navy distillation plants. The need for land based distillation plants was first met in 1922 when Griscom-Russell evaporators were incorporated into the public utility power plant cycle. During the 1930's the company furnished the first large general purpose land-based distillation plants to water-starved areas. These included large plants installed by the Esso Refinery on the island of Aruba, N.W.I. Two plants of similar design were put into operation in Saudi Arabia by the Arabian Americal Oil Company.

Since then, Envirogenics' capabilities have been extended through its own research and development as well as long-term programs for the Office of Saline Water, Department of the Interior, and other agencies of the Federal Government and industrial firms.

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WEIR GROUP

RECEIVED
1 JUL 1980
R. J. SOCOLICH

WEIR WESTGARTH LIMITED

CATHCART GLASGOW G44 4EX SCOTLAND

Telephone: 041 633 1336
Telegrams: Weirwest Glasgow
Telex: 778011

Via Air Mail

YOUR REF RJS:gr
OUR REF WRQ/RH
DATE 23rd June, 1980.

Mr R J Socolich
Kaiser Engineers of Pennsylvania Inc.
300 Lakeside Drive
P O Box 23210
Oakland : California 94623 : U S A

Dear Dick,

I refer to your letter of June 3rd addressed to Peter Simpkin and am responding with information on the Abu-Zeneima project.

You are indeed correct that Weir supplied a 500,000 g.p.d. MSF unit to Sinai Manganese during the early 1960's. This unit was supplied with heat from the gas turbine exhaust through an economiser unit. The effective mode of heat transfer was gas to water to brine. The plant characteristics were a performance of 10:1 for an output of 500,000 g.p.d. with a maximum product quality of 50 p.p.m. The installed cost at that time was in the region of £270,000 and included for the distillation unit, economiser, intake pipework and other minor auxiliaries.

We are not well informed concerning the operating history, as the plant operated for a relatively short time before the advent of the Arab/Israeli War, - known as the 6-Day War. Subsequent to that the plant was dismantled by the Israelis and transferred to Eilat, at which location it has operated since. We have no data concerning its performance at Eilat.

With reference to your current conceptual design for a manganese smelter, and recognising that you have available a 12 MW capacity gas turbine, we predict roughly that this would allow the production of 500,000 g.p.d. with a performance ratio of approximately 7. The cost for a MSF unit to produce this quantity would be £1,800,000, ignoring civil engineering costs, intake systems and heat conversion system from the gas turbine exhaust to give steam for the distiller.

As / ...

Mr R J Socolich

As you know, I shall be in San Francisco from the 6th to 10th July at the NWSIA Conference and I shall take the opportunity of contacting you so that we can talk about this project and any other matters of mutual interest.

Looking forward to meeting you ...

Yours sincerely,

Bill Querns

(W R Querns)

KAISENGS OAK A Hold for Pickup — 604/6154

SIAC MEDA

JUNE 18, 1980

ATTN: MR G F COOPER
KAISER ENGRS.

SUBJECT: SINAI MANGANESE CO., EGYPT
SASAKURA DESAL PLANTS
UR TLX A-63 6-17-80

WE HAVE CHANGED OUR NAME FROM LAWSON PRODUCTS TO SASAKURA INTERNATIONAL AMER. CORP. A WHOLLY OWNED SUB OF SASAKURA ENG.

WE ARE PLEASED TO ADVISE THE FOLLOWING INFO IN RESPONSE TO UR ABOVE REF TLX.

MODEL NO.	MES-2000-8	MES-2500-10
CAPACITY (GPD)	528,000	660,000
OPERATING RANGE (PERCENT)	25 TO 100	25 TO 100
PERFORMANCE LBS/LB	8	10
DISTILLATE PURITY (LESS THAN)	15 PPM	15 PPM
TEMP. S.W. (C)	30	30
TEMP. DISTILLATE (C)	40	40
TOTAL S.W. FLOW (TONS/HR)	630	630
MAKE-UP (FEED) (TONS/HR)	140	175
BBLOW-DOWN (TONS/HR)	57	71
TOTAL STEAM (LBS/HR)	24,200	24,200
ACID (98 PERCENT) (LBS/HR)	40	48
TOTAL POWER (KW)	140	148
DESAL POWER ONLY (KW)	75	83
TOTAL FOB JAPAN COST (EST.)	510 MILLION YEN	620 MILLION YEN
ESTIMATED ERECTION COST	ADD 25 PERC.	ADD 25 PERC.

AS YOU WILL NOTE THE TOTAL STEAM CONSUMPTION IS FAR 'ESS THAN THE AVAILABLE. SHLD THIS AMOUNT BE TOTALLY AVAILABLE FOR DESAL PLANT OUR SYSTEM CAN BE REDESIGNED TO OPERATE AT A LONGER PERFORMANCE RATIO AND LOWER PURCHASE PRICE.

I PLAN TO ATTEND THE NWISA CONFERENCE AT HYATT REG DURING WEEK OF JULY 6 AND WOULD HOPE THAT WE COULD GET TOGETHER TO FURTHER DISCUSS THIS PROJECT OR YOUR REQUIREMENT. BUT IF MEANTIME YOU HAVE ANY QUESTIONS, PLEASE DO NOT HESITATE TO CALL ON US.

BEST REGARDS,

JIM BREEN
SASAKURA INTERNATIONAL
215-565-2900

KAISENGS OAK A
0

SASAKURA INTERNATIONAL AMERICAN CORPORATION

14 SOUTH AVENUE
MEDIA, PA. 19063

TELEPHONE: (215) 565-2900
TELEX 83-1582

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RBG w/encl
GFC w/o encl
vendor file w/

July 17, 1980

Kaiser Engineers
A Raymond International Company
P.O. Box 23210
Oakland, California 94623

Attention: Mr. G. F. Coope

Subject: Sasakura Desalination Plants
Multi-Effect Stack Type

Gentlemen:

With reference to our recent telephone conversation, we are pleased to submit the following budget prices for our series of MES Type Desalination Plants (F.O.B. Kobe, Japan - Export Boxed).

MES-2000-8	510 Million Yen
MES-2500-10	620 Million Yen
MES-3000-10	710 Million Yen
MES-5000-10	1,000 Million Yen (1 Billion)
MES-7500-10	1,350 Million Yen (1.35 Billion)

For your future potential use, we are enclosing additional copies of our catalog and we would be happy to provide a detailed proposal or specific data as required.

Should you have any questions, please do not hesitate to call on us.

Very truly yours,

J. V. Breen

s
encl. (3)

SASAKURA INTERNATIONAL AMERICAN CORPORATION

14 SOUTH AVENUE
MEDIA, PA. 19063

TELEPHONE: (215) 565-2900
TELEX: 83-1582

642.0

June 30, 1980

Kaiser Engineers
A Raymond International Company
P.O. Box 23210
Oakland, Calif. 94623

Attention: Mr. G. F. Cooper

Subject: Sinai Manganese Company
Sasakura Desalination Plant

Gentlemen:

With reference to our recent telex correspondence regarding the subject matter, we are pleased to submit the attached technical information and brochure describing the Sasakura Multi-Effect Stack Desalination Plants.

We hope that this data along with our telex of June 18, 1980 has provided you with information you need to evaluate our plants.

Should at any time you have any questions, please do not hesitate to advise.

Very truly yours,

J. V. Breen

s
encl.

The Sinai Manganese Company

THE EGYPTIAN GENERAL ORGANIZATION
FOR THE METALLURGICAL INDUSTRIES

Head office 1 Kasr El Nil St. Cairo. A.R.E.—Tel. 70395—Cables : Simang Cairo

Messrs. Kaiser Engineers & Constructors Inc.
2. Moh. Sabry Abu-Alam St.,
Cairo - ARE.

Cairo In : ~~March~~ april 3.1980

Our Ref. No. 73/80

Att : Mr. J. Sulzbach
Program Manager

Dear Mr. Sulzbach ,

According to your request - Please find attached herewith the price list concerning the bid of rehabilitation of some buildings at Abu-Zenima area and Om-Bogma .

We notify that these prices represent 50 : 60 % from the costs of the rehabilitation if executed by public sector .

Meanwhile - we remain .

Sincerely Yours.

Genl. S. Demerdash
(Contract Officer)

Enc. 6.

ACB to translate

Team Members
ACB w/enc
JFS
Cairo and w/Att.
- Wallach
- File
London
- Palmer

RECEIVED
3 APR A.M.
Kaiser Engineers, Inc.
J. F. Sulzbach

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 5 DISTRICT 5 HELIOPOLIS - CAIRO, EGYPT
ARCHITECTURAL REGISTRATION No 3771 - TEL 961132

REPAIRS AND RESTORATION OF 5 DWELLING AT OM BOGHA AREA
SINAI-A.R.E.

ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE		TOTAL PRICE	
				L.E	mils.	L.E.	mils.
1	DELIVERY AND CONSTRUCTION OF MASONRY WALLS OF LOCAL STONE WITH C/S MORTAR USING 2 m^3 SAND, 1 m^3 LIME ADDING 200 kgs CEMENT TO EACH CUBIC METER OF THE MIXTURE.	m^3	7 m^3	37	00	259	00
2	IN SQUARE METERS DELIVERY AND CONSTRUCTION WITH CEMENT BLOCKS 12 cm. WITH C/S MORTAR USING 1 m^3 SAND, 300 kgs. CEMENT.	m^2	20 m^2	6	00	120	00
3	DELIVERY AND CONSTRUCTION OF PLAIN CONCRETE HARDCORE 10 cms. THICK CONSISTING OF 0.8 m^3 GRAVEL + 0.4 m^3 SAND + 300 kgs. CEMENT.	m^2	60 m^2	4	00	240	00
4	PROVISION AND INSTALLATION OF GLASS PANELS IN SQUARE METERS.	m^2	34 m^2	8	00	32	00
5	PROVISION AND INSTALLATION OF CEMENT COVERED CEILING PROVIDED WITHOUT CLADDING.	m^2	120 m^2	8	00	960	00
6	PROVISION AND CLADDING OF HARD BOARD PANELS WITH NECESSARY FIXATION.	m^2	110 m^2	12	00	1320	00

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 5 DISTRICT 5 HELIOPOLIS · CAIRO, EGYPT
ARCHITECTURAL REGISTRATION No 3771 – TEL. 981132

ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE L.E.	ITEM RATE mils	TOTAL PRICE L.E	TOTAL PRICE mils
7	DELIVERY AND INSTALLATION OF MOSAIC TILES 20 x 20 x 2 cm. TO BE ADHERED BY MORTAR CONSISTING OF 35 Kgs CEMENT FOR EACH CUBIC METER SAND.	m^2	44 m^2	5.	00	220.	00
8	DELIVERY AND INSTALLATION OF CERAMIC TILES 15 x 15 x 0.6 cm TO BE ADHERED BY CEMENT MORTAR CONTAINING 300 kgs. CEMENT.	m^2	29 m^2	11	00	319.	00
9	PER SQUARE METER DELIVERY AND APPLICATION OF 3 COATS OF PAINT FOR WALLS.	m^2	1000 m^2	3.	50	3500.	00
10	DELIVERY AND APPLICATION OF 3 COATS OF PLASTER FOR WALLS BY USING LIMEWATER SPRAYED BY MACHINE.	m^2	200 m^2	0.	40	800.	00
11	DELIVERY AND PAINTING WINDOW PANELS AND FLUSH PLYWOOD DOORS 3 COATS.	m^2	20 m^2	3.	65	73.	00
12	DELIVERY AND INSTALLATION OF FLUSH PLYWOOD DOORS PRICE INCLUDES PAINTING 3 COATS. DIMENSION OF DOORS 90 x 210 cms.	PER QUANTITY	23	56.	5	1299.	5

HASSAN & OMAR NASSIH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 9 DISTRICT 9 HELIOPOLIS - CAIRO, EGYPT
ARCHITECTURAL REGISTRATION NO 3771 TEL 80113/

ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE L.E.	MILS	TOTAL VALUE L.E.	MILS
.3	PER QUANTITY, DELIVERY AND INSTALLATION OF FLUSH PLYWOOD DOORS. PRICE INCLUDES PAINTING 3 COATS. DIMENSION OF DOORS 77 X 210 CMS.	PER QUANTITY	7	49	00	343	00
.4	PER QUANTITY, DELIVERY AND INSTALLATION OF FLUSH PLYWOOD DOORS PRICE INCLUDES 3 COATS OF PAINT. DIMENSION OF DOORS 65 X 200 CMS.	PER QUANTITY	2	43	00	86	00
.5	PER QUANTITY, DELIVERY AND INSTALLATION OF FLUSH PLYWOOD DOOR. PRICE INCLUDES 3 COATS OF PAINT. DIMENSION OF DOOR 100 X 185 CMS. COMPLETE WITH ALL ACCESSORIES.	PER QUANTITY	1	54	00	54	00
16	DELIVERY AND INSTALLATION OF WIRE MESH DOOR. PRICE INCLUDES 3 COATS OF PAINT DIMENSION OF DOOR 100 X 185 CMS.	PER QUANTITY	1	49	00	49	00
1	DELIVERY AND INSTALLATION OF A FLUSH PLYWOOD DOUBLE DOOR WITH UPPER PART HAVING A WIRE MESH PRICE INCLUDES						

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 5 DISTRICT 5 HELIOPOLIS · CAIRO, EGYPT
ARCHITECTURAL REGISTRATION NO 3771 – TEL. 961132

ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE		TOTAL PRICE	
				L.E.	mils	L.E.	mils
	3 COATS OF PAINT. DIMENSION OF DOUBLE DOOR 100x185 cms.	PER QUANTITY	1	84.	00	84.	00
18	DELIVERY AND INSTALLATION OF 3 mm. PLAIN GLASS FOR WINDOW PANELS IN BUILDINGS.	m^2	100 m^2	7.	00	700.	00
19	DELIVERY AND INSTALLATION OF WHITE GALVANISED IRON MESH.	m^2	176 m^2	4.	00	704.	00
20	DELIVERY AND INSTALLATION OF WALL MOUNTED URINALS OF WHITE VITREOUS CHINA WITH OPENING FOR FLUSH PIPE. PRICE INCLUDES A COPPER VALVE 1/2", IT ALSO INCLUDES CAST IRON GALVANIZED PIPES 1/2" TO BE INSTALLED ACCORDING TO SPECIFICATIONS. INSTALLATION OF MARBLE PARTITIONS BETWEEN URINALS 45x75 cms. WITH THICKNESS 2 cms. + DELIVERY OF LEAD SYPHONES NECESSARY.	PER QUANTITY	2	99.	00	198.	00
21	DELIVERY AND INSTALLATION OF WATER CLOSET SUITE OF VITREOUS CHINA TO BE FIXED						

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 5 DISTRICT 5 HELIOPOLIS · CAIRO, EGYPT
ARCHITECTURAL REGISTRATION No 3771 – TEL 961132

ITEM	DESCRIPTION OF WORK.	UNIT	QUANTITY	ITEM RATE		TOTAL PRICE	
				LE	mils	LE.	mils
	BY MEANS OF BRASS NAILS A WHITE PLASTIC SEAT IS PROVIDED, A 35/42 LEAD FLUSH PIPE TO BE CONNECTED TO W.C. DELIVERY AND INSTALLATION OF A 2 GALLON LOCAL CAST-IRON OVERFLOW TANK (NIAGRA OR HIGH DAM), TO BE FIRST PAINTED 2 COATS OF RED LEAD, THEN 2 COATS OF PAINT. PRICE INCLUDES ALL CAST-IRON 4" PIPES LEADING TO INSPECTION CHAMBER.	PER QUANTITY	8	80.	00	640.	00
22.	DELIVERY AND INSTALLATION OF CAST IRON CHINA PLATED KITCHEN SINK 60 X 47 X 15 cms. WITH OPENING IN THE MIDDLE FOR 2" OUTLET (BRASS OUTLET WITH SEIVE). PRICE INCLUDES 2 IRON BRACKETS 2 X 2 X 1/2", NICKEL PLATED TAP 1/2", ALL NECESSARY LEAD PIPES LEADING TO CAST						

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 5 DISTRICT 5 HELIOPOLIS · CAIRO, EGYPT
ARCHITECTURAL REGISTRATION NO 3771 – TEL. 961132

ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE	TOTAL PRICE
				L.E. mils	L.E. mils
	IRON DISCHARGE PIPES, MARBLE SIDE SHELF 60X45 X 2 CMS. AND BRACKET. PLUS CERAMIC TILES OVER SINK 120 X 45 CMS.	PER QUANTITY	5	60 . 00	300 . 00
23	INSTALLATION ONLY OF A BATH TUB AND MAKING THE NECESSARY FEEDING AND DISCHARGE CONNECTIONS. DELIVERY AND INSTALLATION OF SHOWER SEIVE, 2 NICKEL PLATED WATER TAPS (FOR HOT AND COLD WATER), CERAMIC TILES TO BE ADHERED AROUND TUB.	PER QUANTITY	5	60 . 00	300 . 00
24	DELIVERY AND INSTALLATION OF VITREOUS CHINA WASH BASIN 50X60 CMS. WITH A NICKEL PLATED BRASS OUTLET WITH PLUG AND NICKEL CHAIN. PRICE INCLUDES ½" NICKEL TAP AND ALL NECESSARY FEEDING AND DISCHARGE CONNECTIONS, CERAMIC ABOVE WASH BASIN 60X45 CMS.	PER QUANTITY	6	75 . 00	450 . 00

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5 STREET 5 DISTRICT 5 HELIOPOLIS · CAIRO, EGYPT
ARCHITECTURAL REGISTRATION No 3771 – TEL. 981132

ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE		TOTAL PRICE	
				L.E.	mils	L.E.	mils
25	DELIVERY AND INSTALLATION OF CHINA PLATED CAST IRON FLOOR TRAP (GROUND SYPHONE) ¼" WITH VENT OPENING OR INSPECTION DOOR WITH BRONZE SCREWS COMPLETE WITH ACCESSORIES.	PER QUANTITY	9	19	.00	171	.00
26	DELIVERY AND INSTALLATION OF SHOWER UNIT WITH SEIVE AND ALL ACCESSORIES.	PER QUANTITY	2	95	.00	190	.00
27	DELIVERY AND INSTALLATION OF 4" x ¼" CAST IRON VENT. PIPES ON WALLS, PRICE INCLUDES ALL CAST IRON CONNECTIONS.	meter	30 m.	7.50		225.00	
28	DELIVERY AND INSTALLATION OF 2" CAST IRON PIPES FOR DISCHARGE OF URINALS AND WASH BASINS. PRICE INCLUDES ALL ACCESSORIES AND CONNECTIONS PLUS EXCAVATION, CONCRETE AROUND PIPES AND BACK FILLING.	meter	50 m.	7.00		350.00	
29	DELIVERY AND INSTALLATION OF 4" CLAY PIPES FROM INSPECTION CHAMBER TO WELL AND FROM GULLY TRAP TO INSPECTION						

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ITEM	DESCRIPTION OF WORK.	UNIT	QUANTITY	ITEM RATE L.E. mils	TOTAL PRICE L.E. mils
	CHAMBER, COMPLETE WITH ALL EXCAVATIONS, ORDINARY CONCRETE AND BACKFILLING.	meter	70 m.	8.00	560.00
30	DELIVERY AND INSTALLATION OF 1" IRON PIPES FOR WATER FEEDING, PRICE INCLUDES ALL CONNECTIONS AND FIXATION ON WALLS.	meter	120 m.	6.00	720.00
31	DITTO. ½" DIAMETER	meter	70 m.	4.00	280.00
32	CONSTRUCTION OF 60 X 60 X 50 cm. INSPECTION CHAMBER. PRICE INCLUDES PLAIN CONCRETE 20 cms. THICK AS UNDERCORE, WALLS OF CEMENT BLOCKS 20 cms. THICK, INCLUDES MAKING NECESSARY CHANNELS AT THE BOTTOM, PLASTERING AND AN APPROVED CAST IRON COVER 60 X 60 cms.	PER QUANTITY	6	50.00	300.00
33	DELIVERY AND INSTALLATION OF 6/4" GULLY TRAP, PRICE INCLUDES EXCAVATIONS, CONCRETE WORK AND MASONRY, PROVISION OF A CAST IRON COVER.	PER QUANTITY	6	16.00	96.00

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ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE		TOTAL PRICE	
				L.E.	mils	L.E.	mils
34	CONSTRUCTION OF COLLECTING TANK FROM 2 PARTS ITS INTERNAL DIMENSION IS 2 X 2 X 1/2 m. (1/2 m. DEEP) TO BE CONSTRUCTED OF STONE WITH C/S MORTAR 300 kgs. CEMENT / m^3 SAND, 40cms. THICK ON A CONCRETE HARDCORE 20cms. THICK. INTERNAL PARTITIONS OF TANK 12.5cms. CONCRETE AND RUBBLE, LEAVING NECESSARY OPENINGS, A URINAL 50 X 50 X 10cms. AT THE BASE. THE PRICE INCLUDES THE REINFORCED CONCRETE SLAB 15cms. THICK, (10 STEEL BARS ϕ 3/8", 16 STEEL BARS ϕ 3/8") THE SLAB HAS TWO OPENINGS TO BE COVERED BY 2 CAST IRON COVERS 60 X 60 cms. THE PRICE ALSO INCLUDES PLASTERING THE INTERNAL WALLS BY C/S MORTAR 300 kgs. CEMENT/m^3 SAND. PRICE INCLUDES 2 INSP. CHAMBERS 60 X 60 cms. ONE AT A						

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ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE	TOTAL PRICE
				L.E. mils	L.E. mils
	DEPTH 80cms. DEEPER THAN BOTTOM OF TANK AT ITS ENTRANCE, THE OTHER AT THE EXIT AND OF DIMENSIONS 60x60X 45 cms. 2 CAST IRON COVERS ARE PROVIDED, 2 JOINTS AND CLAY PIPES LEADING FROM INSPECTION CHAMBERS TO TANK, PRICE INCLUDES REMOVAL OF EXCAVATIONS AND RAMMING.	PER QUANTITY	1	1200.00	1200.00
35	DELIVERY AND INSTALLATION OF GALVANIZED STEEL WATER TANK 1x1x1 m 1/8" THICK USING STEEL ANGLES 2/11 X 14/11 AND STEEL BASIN TO BE WELDED AND SCREWED TOGETHER. PRICE INCLUDES MAKING THE NECESSARY HOLES, DELIVERY AND INSTALLATION OF FEEDING AND DISCHARGE PIPES OF GALVANIZED IRON, AN OVER-FLOW PIPE IS PLACED ON TOP OF TANK 3/4". 2 BRONZE VALVES, THE COVER SHOULD BE HINGED, HINGES ARE OF GALVANIZED				

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ITEM	DESCRIPTION OF WORK	UNIT	QUANTITY	ITEM RATE		TOTAL PRICE	
				L.E.	mils.	L.E.	mils.
	IRON, COVER SHOULD BE LEAK PROOF.	PER QUANTITY	6	220	00	1320	00
36	DELIVERY AND INSTALLATION OF:						
	A_ FLUORESCENT LIGHT OFFICE UNIT 1 LAMP 120 cms. 40 watt.	PER QUANTITY	40	20	00	800	00
	B_ DITTO. BUT WITH 2 LAMPS.	"	25	25	00	625	00
	C_ INCANDESCENT LAMP 60 watt	"	25	10	00	250	00
	D_ PLASTIC IMPORTED LIGHT SWITCH.	"	90	4	00	360	00
	E_ DITTO. OUTLET	"	35	6	00	210	00
	F_ DISTRIBUTION BOARD AND FUSE BOX (5 FUSES).	"	5	90	00	450	00
	G_ OUTDOOR BELL WITH SWITCH.	"	5	20	00	100	00

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ARCHITECTURAL REGISTRATION NO 3771 – TEL 981132

WEDNESDAY 9 APRIL 1980

ARCH. O. FAWZY

RECREATION AND PUBLIC BUILDINGS AREA:

— RECREATION:

PUBLIC RESTAURANT, SOCIAL CLUB (FOR EXECUTIVES), SPORTING CLUB (FOR WORKERS), SHOPPING CENTER, CINEMA AND OPEN AIR THEATER.

— PUBLIC BUILDING SECTOR:

ELECTRICITY PLANT, WATER PLANT, SHELTER, WORKSHOP ADMINISTRATION BUILDING, ICE FACTORY.

— TOTAL ESTIMATED COST FOR REPAIRS FOR THE RECREATION AND PUBLIC BUILDINGS AREA = Aprox. 120,000 L.E.

— THIS TOTAL EVALUATION INCLUDES REPAIRS FOR THE FOLLOWING BUILDINGS ONLY:—

PUBLIC RESTAURANT, SOCIAL CLUB (FOR EXECUTIVES), SHOPPING CENTER, CINEMA AND OPEN AIR THEATER, ELECTRICITY AND WATER PLANTS, ADMINISTRATION BUILDING, ICE FACTORY, WORKSHOPS (NEW ONES ONLY).

— BUILDINGS NOT INCLUDED IN THIS EVALUATION:—

SHELTER, OLD RESIDENTIAL AND PUBLIC BUILDINGS AND WORKSHOPS, MOSQUE, OLD SCHOOL.

— ITEMS CONSIDERED FOR REPAIRS:

CARPENTRY (ALL DOORS + WINDOWS), GLASS FOR ALL WINDOWS AND CRITTAL DOORS, ALL SANITARY FIXTURES

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PIPEWORK (FEEDING AND DISCHARGE PIPES), ELECTRICAL WORK (FLUORESCENT & INCANDESCENT LAMPS , SWITCH AND OUTLET FITTINGS , DISTRIBUTION BOARDS).

- ITEMS NOT CONSIDERED IN THIS EVALUATION
  PAINTING FOR WORKSHOPS , VENETION BLINDS FOR SOCIAL CLUB (EXECUTIVES), PAINTING FOR SPORTING CLUB (WORKERS) , THERMAL INSULATION FOR ICE FACTORY,

— THE EVALUATION FOR REPAIRS FOR ~~THESE~~ THE BUILDINGS REPRESENTS A PERCENTAGE OF ABOUT 10% – 12% OF THE TOTAL COST OF THE PREVIOUSLY MENTIONED BUILDINGS AT 1980 RATES.

— THE EVALUATION DOES NOT INCLUDE AN ESTIMATE OF REPAIRS FOR INFRA STRUCTURE AND TOWNSITE FACILITIES.

2-50%

OMAR
12-04-80

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
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ARCHITECTURAL REGISTRATION NO 3771 - TEL. 981132

SUNDAY 6 APRIL 1980

RESIDENTIAL AREA : (NEW BUILDINGS).

CONSISTS OF 4 TYPES :-

TYPE A : MARRIED EXECUTIVES VILLA'S.

TYPE B : BACHELOR EMPLOYEES QUARTERS.

TYPE C : MARRIED FOREMEN AND WORKERS HOUSES.

TYPE D : BACHELOR WORKERS QUARTERS.

TYPE	NEED REPAIRS	ALREADY REPAIRED	TOTAL No
A	15	4	19
B	21	4	25
C	40	4	44
D	11	2	13
	87		

TYPE A : IS A VILLA TYPE FOR 1 FAMILY ONLY.
IT CONSISTS OF : ENTRANCE HALL, LIVING ROOM
DINING ROOM, KITCHEN, HANDS TOILET -
2 BEDROOMS, 1 BATHROOM.

TYPE B : CORRIDOR TYPE UNIT FOR 6 EMPLOYEES EACH.
IT CONSISTS OF 6 SEPERATE ROOMS EACH WITH A
PRIVATE BATHROOM. AT THE END OF THE CORRIDOR
FROM ONE SIDE THERE IS A KITCHEN, AT THE OTHER
END THERE IS A COLLECTIVE LIVING ROOM.

TYPE B_1 : SAME AS TYPE B IN ALL ASPECTS BUT EACH
2 ROOMS SHARE 1 BATHROOM FOR SINGLE FOREMEN

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TYPE C : 2 SEMI-ATTACHED VILLAS. EACH UNIT FOR 2 FAMILY'S.
IT CONSISTS OF LIVING-DINING AREA, KITCHEN BATHROOM AND 2 BEDROOMS.

TYPE D : CORRIDOR TYPE WITH 4 SPACIOUS ROOMS EACH ROOM FOR 6 WORKERS. (EACH UNIT FOR 24 WORKERS), WITH A COMMUNAL KITCHEN.

— ESTIMATED REPAIR PRICE FOR EACH TYPE.

TYPE A :	EACH	UNIT	NEEDS	AVERAGE	COST	REPAIR	= 3320 L.E
TYPE B :	"	"	"	"	"	"	= 5650 L.E
TYPE C :	"	"	"	"	"	"	= 4150 L.E
TYPE D :	"	"	"	"	"	"	= 4875 L.E

— TOTAL ESTIMATION OF REPAIRS FOR RESIDENTIAL AREA:

FOR ALL	TYPE A	UNITS (15 UNITS)	= 49,800	L.E.
" "	TYPE B	UNITS (21 UNITS)	= 118,650	L.E.
" "	TYPE C	UNITS (40 UNITS)	= 166,000	L.E.
" "	TYPE D	UNITS (11 UNITS)	= 53.625	L.E.

FOR CHAIRMAN OF THE BOARDS 2-STOREY VILLA = 6.000 L.E.

— TOTAL ESTIMATED COST FOR REPAIRS OF THE ENTIRE NEW RESIDENTIAL AREA = APROX. 395,000 L.E.

HASSAN & OMAR NASSEH FAWZY
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PAINTING, CARPENTRY (ALL DOORS AND WINDOWS, CLOSETS, BALCONY DOORS ETC..), GLASS + WIRE MESH FOR ALL WINDOWS
ALL SANITARY FIXTURES INCLUDING:- W.C.'S, WASHBASINS, SINKS, SHOWERS - ALL PIPEWORK (FEEDING AND DISCHARGE PIPES, VENT PIPES, SOIL PIPES etc..): WATER TANK, INSPECTION CHAMBERS, GULLY TRAPS ....
ALL ELECTRICAL WORK INCLUDING: DISTRIBUTION BOARD, FUSE BOX, DOOR BELLS, CONNECTIONS, SWITCH, OUTLET, INCANDESCENT LAMPS.

THIS ESTIMATION DOES NOT INCLUDE TOWNSITE FACILITIES AND INFRASTRUCTURE.

— THE FIGURE REACHED AS ESTIMATION OF COST FOR REPAIRS FOR EACH UNIT HAS BEEN FOUND OUT TO BE ABOUT FROM 18.8% to 22% OF THE TOTAL COST OF BUILDING SUCH A UNIT AT 1980 RATES.

TYPE	AVAILABLE UNITS	NO OF PERSONS FOR EACH TYPE	STATUS OF PERSONS FOR EACH TYPE
A	19	19	EXECUTIVES (FAMILY)
B	25	150	EMPLOYEES + FOREMEN (SINGLE)
C	44	88	FOREMEN & WORKERS (FAMILY)
D	13	312	WORKERS (SINGLE).

HASSAN & OMAR NASSEH FAWZY
ARCHITECTS ENGINEERS PLANNERS
5 STREET 5 DISTRICT 8 HELIOPOLIS · CAIRO, EGYPT
ARCHITECTURAL REGISTRATION No 3771 — TEL. 981132

— ACCORDING TO MANNING SCHEDULE.

TOTAL LABOUR = 490 { LABOURERS (MAINLY UNSKILLED) / SUPERVISORS (SKILLED).

TOTAL STAFF PERSONNEL = 119.

— PERCENTAGE OF MARRIED LABOURERS TO SINGLE LABOURERS:

22 % MARRIED 78 % SINGLE.

— PERCENTAGE OF MARRIED STAFF PERSONNEL TO TOTAL STAFF,

12 % MARRIED 88 % SINGLE.

THIS PERCENTAGE HAS BEEN ASSUMED ACCORDING TO Nº OF LIVING QUARTERS (UNIT TYPES AVAILABLE) FOR MARRIED WORKERS + PERSONELL TO TOTAL Nº. OF WORKERS + PERSONELL

AVAILABLE DWELLINGS TO ACCOMODATE	Nº OF INHABITANTS (WORKERS + EMPLOY.)	Nº OF PERSONS IN NEED OF LIVING QUARTERS	Nº OF HOUSES NEEDED	TYPE
19	19	—	—	—
150	100	—	—	—
88	108	20	10	C
312	382	60	3	D

ARCH. O. FAWZY

TUESDAY, 15 APRIL 198

RESIDENTIAL AREA : [NEW BUILDINGS].

TYPE A : VILLA FOR 1 FAMILY ONLY (MARRIED EXECUTIVE)
TOTAL AREA = 90 m^2
AREA OF TERRACE = 16 m^2

TYPE B : BACHELOR EMPLOYEES QUARTERS : (FOR 6 EMPLOYEES)
TOTAL AREA OF BLOCK = 180 m^2
THE BLOCK CONSISTS OF 6 SEPERATE ROOMS EACH WITH A PRIVATE BATHROOM. EACH ROOM IS ABOUT 10 m^2 + 4.6 m^2 ENTRANCE HALL + 2.55 m^2 BATHROOM.

TYPE C : 2 SEMI-ATTATCHED VILLA'S FOR MARRIED WORKERS (EACH UNIT FOR 2 FAMILYS).
TOTAL AREA OF BLOCK = 100 m^2
i.e. 50 m^2 FOR EACH VILLA.

TYPE D : SINGLE WORKERS BLOCK (FOR 24 WORKERS).
TOTAL AREA OF BLOCK = 234 m^2
THE BLOCK CONSISTS OF 4 ROOMS AND A KITCHEN EACH ROOM CONSISTS OF A SPACIOUS B.R (24 m^2) (FOR 6 WORKERS) + ENT. HALL, LOCKERS AND W.C. + SHOWER (16 m^2).

CHAIRMAN OF THE BOARDS VILLA : A 2-STOREY VILLA
TOTAL AREA = 200 m^2 approx.

PUBLIC AREA :

— GAS STATION : (FOR BENZINE) NEAR THE NEW WORKSHOPS AND WAREHOUSE .

TOTAL AREA = 210 m^2

— WAREHOUSE : TOTAL AREA = 576 m^2 aprox.
WITH 4 m. CANTILEVER FROM BOTH SIDES
(SHEDED AREA).

— SHED [CAR PARK] : SHED FOR 38 CARS
76 X 12 m.

— MECHANICAL WORKSHOP : TOTAL AREA = aprox. 940 m^2

— CAR MAINTENANCE WORKSHOP : aprox. 940 m^2.

— SPORTING CLUB : FOR WORKERS
2 STOREY BUILDING
TOTAL AREA = aprox. 650 m^2.
GROUND FLOOR AREA = aprox. 452 m^2

— SOCIAL CLUB : FOR EXECUTIVES
2 STOREY BUILDING
TOTAL AREA = aprox. 720 m^2.
GROUND FLOOR AREA = aprox. 523 m^2.

TRANSLATION

946
941
962 D

El Nasr Co. for Coke & Basic Chemicals
El Tebin - Helwan - Cairo

Chairman of Sinai Manganese Co

Referring to your letter for the supplying Coke to your factories at 1981, and to your quesstionnaire about the possibilities of our company.

We beg to inform your goodselves that;-

1- The quantities which may be available are 1500 ton / month i. e about 50 ton / day.

2- The chemical specifications of the produced coke are :-

Ash	9. 5 %	
Carbon	68. 0 %	Minimum
Sulphur	1. 2 %	
Volatiles	1. 3 %	
Moisture	5. 0 %	
Calorific Value	7000	Kilo calory / Kg .

3- The price of the produced ton of coke depends on the price of purchase ore which changes from year to year according to the price of the imported Coal . So, the price could be calculated accordingly.

Best regards,

Eng. M. A. El Mousy
Manager of the Coke & Basic Chemicals Factory

شركة النصر لصناعة الكوك والكيماويات الأساسية

"التبين - حلوان - القاهرة"

العنوان التلغرافي "كيميكوك" حلوان - تليفون : ٣٩٩٥٤ - ٣٨٢٧١ - ٣٩٧٥٧ - ٣٨٥٩٨

السيد المهندس/ رئيس مجلس ادارة
شركة سيناء للمنجنيز
١ شارع قصر النيل - ق

بعد التحية :

بالاشارة الى خطابكم الخاص بتوريد فحم كوك الى مصانعكم اعتبارا من عام ١٩٨١ وتساؤلاتكم بشأن امكانيات شركتنا فانى اوضح التالى :

اولا : الكميات يمكن توفيرها بواقع ١٥٠٠ طن شهريا بصفة مبدئية اى بواقع ٥٠ طن يوميا تقريبا .

ثانيا : المواصفات الكيماوية للكوك المنتج كما يلى :

رماد	٩٫٥	١٠٪
كربون ثابت		٨٦٪ (حد أدنى)
كبريت	١٫٢	٪
مواد متطايرة	١٫٣	٪
رطوبة		٥٪
قيمة حرارية	٧٠٠٠ ك كالورى/كجم .	

ثالثا : سعر طن الكوك المنتج يرتبط بسعر الخام المشترى وهذا يتغير من عام لآخر ويتحدد طبقا لسعر استيراد الفحم الحجرى الخام من الخارج وعلى ذلك فان السعر يمكن تحديده عند التعاقد سنويا .

برجاء الاحاطة . مع تمنياتنا بتعاون مستمر لخدمة الوطن .

وتفضلوا بقبول فائق الاحترام ،

مدير قطاع الكوك والكيماويات
وعضو مجلس الادارة

(مهندس/محمد عادل المرزى)

شركة النصر لصناعة الكوك والكيماويات
التبين ص.ب ١٤٩٢ القاهرة
٦ مارس ١٩٧٩
الموضوع رقم ٢٥١/ صادرات

تحريرا فى : ١٩٧٩/٢/٤

531 ~~948~~
951
orig. 692.D

KAISER ENGINEERS

KAISER ENGINEERS AND CONSTRUCTORS INC
300 LAKESIDE DRIVE
POST OFFICE BOX 23210
OAKLAND CALIFORNIA 94623 · CABLE KAISENGS

PLEASE ADDRESS REPLY TO
2 MOTI SABRY ABU ALAM
P O BOX 2548
CAIRO, A R E
Telex 92564 ATLOZ UN/Phone 740151

Egyptian General Petroleum Corporation
Nasr City
Cairo

31 March, 1980

Attention: Engr. Botros F. Barsom, General Manager of Production

Subject: Natural Gas Requirements
Sinai Ferromanganese Project

Dear Mr. Barsom,

Please reference the letter dated 22 March 1980, file reference No. 57/80 from the Sinai Manganese Company to the Egyptian General Petroleum Corporation, introducing Kaiser Engineers and the Arab Consulting Bureau, who have been engaged by the Sinai Manganese Company to conduct a Prefeasibility Study relative to production of ferromanganese at Abu Zeneima in the Sinai.

We wish to express our appreciation for the most useful and informative meeting held in your office on 27 March 1980.

In order to expedite our study work, and develop a realistic basis for project evaluation, we urgently need definitive information relative to the proposed use of natural gas to generate electric power and desalinate sea water at Abu Zeneima. Therefore we have prepared, and hereby submit to you, a questionnaire which outlines the anticipated schedule of demand, and defines the information required from your organization.

Because of the limited time available to complete our study work, we are requesting that the questionnaire be completed and returned to us by 30 April 1980, or sooner. If there are any questions, please feel free to phone us at 740-151. Certainly we will be happy to return to your offices at an early opportunity to discuss any or all of the aspects of this project relating to natural gas.

Again, we want to thank you for the cooperation and help given thus far. We look forward to continued close collaboration on what should be an excellent opportunity to utilize local natural resources to help in the important task of full industrial and community development of the Southern Sinai.

We hope to hear from you soon.

Sincerely yours,
Kaiser Engineers & Contractors, Inc.

John Sulzbach - Program Manager

FS
ACB
GREENWALT
OAKLAND
FILE

JFS/vh
cc Sinai Manganese Co.

NECI/ACB
3/31/80

SINAI FERROMANGANESE PROJECT
NATURAL GAS REQUIREMENTS
QUESTIONNAIRE

1. Anticipated Demand

The following is the projected schedule of natural gas requirements for the proposed 20,000 t/y ferromanganese smelter at Abu Zeneima.

YEAR OF PROJECTED PRODUCTION	ESTIMATED GAS REQUIREMENTS-MNm^3	
	ANNUAL	CUMULATIVE
1982	-	-
1983	30	30
1984	60	90
1985	80	170
1986	80	250
1987	80	330
1988	100	430

After 1988, demand is expected to be about 100 million Nm^3/y for the following 15 years. Estimate is based on gas assumed supplied at a gross heating value of 9000 cal/Nm^3 and a pressure of 3 atmospheres.

2. Gas Analysis

Please submit a complete analysis of the projected gas supply, including liquids, inerts, heating values and contaminants such as sulfur and mercury.

3. Probable Source

Please advise the probable source for the Abu Zeneima gas supply, whether offshore or onshore, and the projected size and length of a suitable gas pipeline to the smelter site.

4. Availability of Supply

We would also appreciate your comments on the above schedule of demand, in relation to the timing of gas availability and the construction of a supply system.

5. Price - Natural Gas

Please advise what prices would apply per normal cubic meter or per 1000 standard cubic feet for your gas delivered to project boundary in Abu Zeneima, cleaned and processed.

6. Price - Naphtha

Please advise what prices would apply for condensate naphtha to be obtained from the gas supply system. Our expected requirements for naphtha are 1000 barrels per month.

Head of Ministers Board
Vice Minister for the Reconstruction
Affairs Office

Ministerial Decreto
No. 26 of 1977 year

Vice Minister for the reconstruction affairs :

After refering to law No. 43 of 1974 for the issuing of the descipline of the Investement of Arab Foreign Funds & the Free Zones.

And the Law No. 62 of 1974 concerning some of the reconstruction.

And the Law No. 113 of 1975 year for the amending of Law No. 62 of 1974 concerning some of the regulations of reconstruction.

And the President Decreto No. 250 of 1977 year for appointing a vice Minister for the reconstructions affairs in the Head Minister Board and defening his responsibilities

And on the Ministerial Decreto No 242 of 1977 year for the taxes exemptations

And on what the Committee composed by the Minister Decreto No. 437 of 1975 year - for defening the operations and projects under the exemptation coming in Law No. 62 of 1974 year. amended by Law No. 113 of 1975 year.

Decided

Article 1 - Sinai Manganese Mining Co 's projects in Sinai Peninsula are exempled from taxes and costum duties due to what the company import from the primary materials with all its kinds, the machines and equipments , trucks and vehicles and others from fixed and portable assets needed for these projects

Article 2 - S M C must offer the purchasing documents to the commettee composed by the ministerial decreto No 437 of 1975 year mentioned, to look for the documents approaval to offer it the taxes Administration, and this is after the approval of the Ministry of Industry and Mineral Wealth to get sure that these materials are for the projects inside Sinai and is covered by the exemptations stated in the above Article.

Article 3 - The Head of the Central organization of Reconstructions have to issue the needed instructions for the executions of this decreto.

Article 4 - This decreto to be published in the Governmental newspaper.

Vice Minister
for the Construction Affairs

Eng. Hasab Alla El-Kafrawy

Qty.	Description	Domestic Costs, LE	Foreign Costs, US$	Combined Totals, LE	1	2	3
	Mining & Ore Transport						
1	Rotary Drill	200	72000	50600			
3	L-H-D Units	1000	271500	191000			
3	Trucks, Mine	1000	304500	214200			
3	Crawler Tractors	1000	735000	515500			
1	Service Truck	-	8500	6000			
1	Water Truck, Potable	7000	30000	28000			
4	Water Tanks, Salt	12000	-	12000			
4	Water Pumps	-	6000	4200			
3	Motor Graders	1000	300000	211000			
3	Personnel Carriers	500	24000	17300			
8	Jackleg Drills		25600	17900			18
3	Compressors	300	102000	71700			
7	Haulage Trucks	700	560000	392700			393
1	Ambulance		15000	10500			
1	Lub. Unit	3000	25000	20500			
2	Buses, Personnel	14000	40000	42000			
2	Seawater Tank Trucks	30000	120000	114000			
	Subtotal				0	0	411
	Freight 10%				0	0	41
	TOTAL COSTS				0	0	452

Note: Year 1 is assumed to be the first year of production, which is equivalent to Year program.

PMENT REPLACEMENT SCHEDULE
MINING & ORE TRANSPORT

Replacement Costs per Year, in Thousands of LE

4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
						51										
			191							191						
	214					214						214				
		172	344						344	172						
	6					6					6					
						28										
						12										
	4					4					4					
							211									
17				17				17				17				
		18			18			18			18			18		
	72					72					72					
		393			393			393			393					
						11										
				21								21				
42				42				42				42				
		114					114				114					
59	296	697	535	80	411	398	325	470	344	363	607	294	0	18	0	0
6	30	70	54	8	41	40	33	47	34	36	61	29	0	2	0	0
65	326	767	589	88	452	438	358	517	378	399	668	323	0	20	0	0

ar 3 after start of project implementation, i.e. immediately following the 2-year construction

1279 MADE IN U.S.A.

EQUIPM
PROCES

Qty.	Description	Domestic Costs, LE	Foreign Costs, US$	Combined Total, LE	1	2	3
Smelter							
1	Front end loader, 988B	1	262	184			
2	Front end loader, 950	1	185	131			
2	Front end loader, Bobcat	1	31	23			
1	Bulldozer D7	1	173	122			
1	Forklift, V140	1	41	30			
1	Forklift, V30C	1	27	19			
2	Dumptrucks	1	68	49			
Maintenance & Townsite							
1	Backhoe	1	70	50			
1	Crane 75T	1	450	316			
1	Crane 20T	1	200	141			
1	Maintenance Truck	1	70	50			
1	Forklift, 4T	1	32	23			
1	Ambulance	1	20	15			
1	Flat bed truck w/hoist	1	25	19			
2	Stake body trucks	1	26	19			
1	Four wheel drive vehicle	1	16	12			
1	Garbage truck	1	32	23			
1	Fire truck	1	85	61			
1	Tow truck	1	67	48			
1	Bus, 24 seats	1	38	28			
7	Pickup trucks	1	84	60			
1	Water truck	1	30	22			
20	Garbage bins	1	25	19			
Subtotal, Smelter, Maint. & Townsite					0	0	0
Freight, 10%					0	0	0
TOTAL COSTS					0	0	0

Note: Year 1 is assumed to be the first year of production, which is equivalent to Yea
program.

260

PLACEMENT SCHEDULE
T & INFRASTRUCTURE

Replacement Costs per Year, in Thousands of LE

4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
																	1
																	2
				184						184							3
		131							131								4
	23					23					23						5
	122							122									6
			30							30							7
			19							19							8
49				49				49				49					9
																	10
																	11
																	12
				50													13
							316										14
					141												15
	50					50				50							16
			23							23							17
						15											18
19				19				19				19					19
19				19				19				19					20
	12					12					12						21
			23							23							22
						61											23
						48											24
	28					28					28						25
	60					60					60						26
	22					22					22						27
			19							19							28
87	317	131	114	321	141	319	316	209	131	348	145	87	0	0	0	0	29
9	32	13	11	32	14	32	32	21	13	35	15	9	0	0	0	0	30
																	31
96	349	144	125	353	155	351	348	230	144	383	160	96	0	0	0	0	32

3 after start of project implementation, i.e. immediately following the 2-year construction.

ESTIMATED ANNUAL COMPENSATION

(7 hour day-6 day week)

Job Classification	LE/mo (a)	Social Insurance (b)	Annual Cost LE
Staff			
Resident Manager	650	780	9400
Plant Manager	550	660	7900
Superintendent	450	540	6500
Manager-Ind. Relations	350	420	5100
Chief Accountant	350	420	5100
Purchasing Agent	300	360	4300
Senior Engineer	650	780	9400
Junior Engineer	260	310	3800
Asst.Engineer	200	240	2900
Secretary	260	310	3800
Clerk	200	240	2900
Skilled Labor			
Brick Mason	340	410	4900
Carpenter	270	320	3900
Boilermaker	270	320	3900
Mechanic	340	410	4900
Welder	270	320	3900
Machinist	270	320	3900
Electrician	270	320	3900
Instrument	270	320	3900
Truck Driver	270	320	3900
Equip. Maintenance	270	320	3900
Laboratory	270	320	3900
Plumber	270	320	3900
Maint. Foreman	270	320	3900
Vehicle Driver	140	170	2000
Semi-skilled Labor	170	200	2500
Common Labor	100	120	1500

(a) 1980 Cairo wages for private sector, plus 30% desert pay
(b) 20.5% Social Insurance included

To Cairo 1980 Cairo wages multiply column (a) figures by 0.7692307

ESTIMATE OF ANNUAL OPERATING COSTS
MINING & ORE TRANSPORT
70,000 Tonnes Ore

A. Labor

No.	Classification	Rate per Month, LE	Including 20.5% Fringes	Total Annual Costs LE
6	Drillers	270	320	23,000
6	Heavy Equip. Ops.	270	320	23,000
3	Cable Men	170	200	7,200
3	Bin Men	170	200	7,200
4	Service Drivers	140	170	8,200
2	Compressor Ops.	170	200	4,800
4	Drill Helpers	170	200	9,600
5	Labor	100	120	7,200
12	Truck Drivers	270	320	46,100
45				LE 136,300
10	Mechanic A	340	410	49,200
8	Mechanic B	270	320	30,700
2	Electricians	270	320	7,700
6	Laborers	100	120	8,600
4	Tire Shops	170	200	9,600
2	Welders	270	320	7,700
32				LE 113,500
1	Mine Supt.	650	780	9,360
1	Mine Engineer	650	780	9,360
2	Mine Foreman	270	320	7,680
1	Maintenance Foreman	270	320	3,840
1	Surveyor	260	310	3,720
1	Clerk	200	240	2,880
				LE 36,840
		Subtotal, Labor		286,640

B. Equipment Operation & Supplies, Surface Mining

No.	Description	Total Annual Costs, LE
1	Rotary Drill with compressor	14,700
1	L-H-D Machine	33,600
1	Mine Dump Truck	16,800
2	Jigback Cable Trams	5,400
1	Crawler Tractor	24,500
1	Service Truck	1,800
2	Personnel Carriers	4,200
3	Ore Transport Trucks, 15-tonne (2 shifts)	271,300
1	Motor Grader	6,300
Lot	Explosives, 20 tonnes plus fuse, detonators	20,200
	Subtotal	398,800

C. Equipment Operation & Supplies, Underground Mining

4	Jackleg Drills, Multiple Headings	27,200
2	Compressors	4,600
1	Load-Haul-Dump Vehicle	28,000
1	Mine Dump Truck	14,000
2	Jigback Cable Trams	3,900
1	Crawler Tractor	14,700
1	Service Truck	1,800
2	Water Tank Trucks, Salt Water	8,800
1	Water Pump	400
1	Personnel Carrier	2,100
2	Ore Transport Trucks, 15-tonne (2 shifts)	180,900
1	Diesel Generator	1,300
1	Motor Grader	10,500
1	Bit Grinder	2,100
1	Axivane Fan	700
Lot	Explosives, 21 tonnes plus fuse, detonators	17,600
	Subtotal	318,600

D. Operating Costs, Other Facilities

2	Buses, Allow	7,000
Lot	Bins Field Costs, etc., Allow	7,000
		14,000

TOTAL ANNUAL OPERATING COSTS LE 1,018,040

DEVELOPMENT OF ENERGY COSTS

Availability of natural gas in sufficient quantities from the Petrobel concessions at Belayim to serve this project through the year 2000 has been confirmed by the Egyptian General Petroleum Corporation (EGPC) in their letter dated 3 July 1980 (which appears in Appendix 3). This is the same gas source as orginally planned for the project in 1967. The calorific values and chemical analyses are known and confirmed. A confirmed price for this gas is not available, nor is a realistic and/or confirmed schedule for extension of the high voltage transmission line from Suez by the Egyptian Electrical Authority (EEA). Therefore, project feasibility in this report was evaluated for a range of likely electric power energy costs, based on power generation with gas turbines stationed at Abu Zeneima.

Energy costs chosen and/or calculated, and the rationale for their selection, can be summarized as follows:

	Electricity £E/kWh	Gas £E/m^3
A. Based on gas price in existing contract between SMC and EGPC	0.000527	0.00165
B. Based on average world energy costs paid by other ferroalloy producers	0.00974	0.0305
C. Based on international (USA) gas energy costs	0.01393	0.0436
D. Based on EEA rate applicable to Law 43 foreign joint-ventures	0.04124	0.1290

Electric energy costs were calculated from selected gas prices, or from standard EEA rate tables. Calculations for project gas prices equivalent to standard EEA rates reflect deductions from those rates for generator plant capital and operating costs already included in project estimates, which would not be required if power were available directly from EEA. This approach thus provides valid comparisons of energy costs, expressed as equivalent costs for gas or electricity.

The gas turbine plant is assumed to operate 365 days per year, 24 hours a day, at 23% efficiency, to produce 12,000 kW. Gas is assumed to come from Belayim fields with calorific values ranging from 11,705 to 11,774 kcal/m^3. Project gas is expected to come from marine reservoirs (at high end of calorific content range) but for these calculations, a

value of 11,700 kcal/m³ was assumed. Annual depreciation of generation facilities was taken at 0.0872 of total capital costs, which is the capital recovery factor for 6% over 20 years.

o Total daily gas requirement for electric power

$$\frac{12{,}000 \text{ kW}}{0.23} \times \frac{860 \text{ kcal/kW} \times 24 \text{ h/d}}{11{,}700 \text{ kcal/m}^3} = 92{,}040 \text{ m}^3\text{/d}$$

$$92{,}400 \times 35.31 = 3.250 \text{ million ft}^3\text{/d}$$

o Plant daily operating costs (except gas)

Depreciation, £E 6,559,000 x 0.0872	=	£E 572,000
Spare parts, $ $\frac{463{,}000 \times 0.7}{4 \text{ years}}$	=	82,000
Supervision, 8 @ 7000	=	56,000
Operating labor, 13 @ 3900	=	51,000
Maintenance labor, 20 @ 3900	=	78,000
Lubricants	=	8,000
Subtotal, cost/year		£E 847,000
Cost/day $\frac{847{,}000}{365}$	=	£E 2,321

A. Gas at Price in Existing SMC/EGPC Contract

SMC has advised that, according to the original contract, gas was to be supplied from Belayim at a cost of £E 0.00165 per cubic meter. According to government regulations regarding contractual obligations interrupted by the Sinai occupation, this contract can be considered as still in effect. The energy cost of generated power is calculated as follows, using generator efficiency of 23%, and calorific value as 11,700 kcal/m³:

	Electricity £E/kWh	Gas £E/m³
$\frac{£E\ 0.00165/m^3 \times 860 \text{ kcal/kWh}}{11{,}700 \text{ kcal/m}^3 \times 0.23 \text{ eff.}}$ =	0.000527	0.00165

B. Gas at Average World Energy Costs Paid by Other Ferroalloy Producers

Information gathered by our special technical consultant (Satra Corporation) and transmitted to SMC (by KECI letter SMI-094A dated 2 July 1980 which appears below) indicates that the average cost of electric power for ferroalloy producers in the free world is £E 0.0178 per kilowatt-hour. The equivalent cost of gas energy required to generate power at this rate at Abu Zeneima can be determined by first calculating and deducting the comparable energy cost component of the total electric power cost.

Using capital and operating costs estimated for the gas turbine generating plant at Abu Zeneima, the amount available for fuel as as follows:

12,000 kW x 24 h/d x 0.0178 £E/kWh	=	5,126 £E/d
Plant costs without fuel	=	2,321
Available for gas	=	2,805 £E/d

The cost of gas from the producers would therefore have to be:

$$\frac{2{,}805 \text{ £E/d}}{92{,}040 \text{ m}^3\text{/d}} = \underline{0.0305 \text{ £E/m}^3}$$

or,

$$\frac{0.0305 \times 1{,}000}{35.31 \times 0.70} = \$1{,}23/1000 \text{ f}^3 \text{ (std)}$$

The equivalent electric energy cost would then be:

$$\frac{0.0305 \text{ £E/m}^3 \times 860 \text{ kcal/kWh}}{11{,}700 \text{ kcal/m}^3 \times 0.23 \text{ eff}} = \underline{0.00974 \text{ £E/kWh}}$$

C. Gas at Price Charged Internationally (USA)

There is no standard international price for gas because of vast differences in transport costs, supply, and demand. For example, a review of Electrical Week for 4 August 1980 indicates that electric utility companies in the USA are now paying costs ranging from $0.23 to $4.14 per million Btu delivered to point of consumption. For purposes of this study, an arithmetic mean price of $2.185/M Btu was selected. To develop an equivalent cost for Belayim gas, a deduction must be made for the capital carrying charges for the fuel supply system (pipeline, etc.) which are included in project capital cost estimates.

$$\text{Pipeline costs} = \frac{\text{£E } 1{,}055{,}000 \times 0.0872}{365 \times 92{,}040 \text{ m}^3\text{/d}} = 0.0274 \text{ £E/m}^3$$

The equivalent cost of gas at USA rates would be as follows:

$$\frac{\$2.185/\text{MBtu} \times 11{,}700\ \text{kcal/m}^3}{1{,}000{,}000 \times 0.252\ \text{Btu/kcal}} \times 0.7\ £E/\$ = 0.0710\ £E/m^3$$

Then, the equivalent net cost of gas energy, delivered to the project at gas source in Belayim, would be:

$$0.0710 - 0.0274 = \underline{0.0436\ £E/m^3}$$

The equivalent cost of electricity energy would be as follows:

$$\frac{0.0436\ £E/m^3 \times 860\ \text{kcal/kWh}}{11{,}700\ \text{kcal/m}^3 \times 0.23\ \text{eff}} = \underline{0.01393\ £E/\text{kWh}}$$

D. Gas at EEA Rate for Law 43 Joint Ventures

The EEA standard rate for Law 43 foreign joint-venture firms producing for domestic market could be applicable. This basic rate was calculated as 46.072 millemes/kWh per J. Sulzbach memo of 1 April 1980 (which appears below) and pertinent EEA rates. In addition, a power factor penalty of 0.5% per 1% differential should be added for the estimated penalty differential of 14% from the anticipated project power factor of 0.76. The net energy cost component can then be calculated by allow-
ing a deduction for generation plant costs (2321 £E/d) included already in project capital cost estimates.

$$\text{Applicable EEA rate} = \frac{46.072}{1{,}000} \times 1.07 = 0.0493\ £E/\text{kWh}$$

Then, 12,000 kW x 24 h/d x 0.0493	=	14,198 £E/d
Deduction for plant costs without fuel	=	2,321
Available for buying gas		11,877 £E/d

Cost of gas from producers would then have to be:

$$\frac{11{,}877\ £E/\text{day}}{92{,}040\ m^3/\text{day}} = \underline{0.1290\ £E/m^3}$$

The equivalent electric energy cost would then be:

$$\frac{11{,}877}{14{,}198} \times 0.0493\ £E/\text{kWh} = \underline{0.04124\ £E/\text{kWh}}$$

121
915

KAISER ENGINEERS

KAISER ENGINEERS AND CONSTRUCTORS, INC
300 LAKESIDE DRIVE
POST OFFICE BOX 23210
OAKLAND, CALIFORNIA 94623 · CABLE KAISENGS

PLEASE ADDRESS REPLY TO:
2, MOTI SABRY ABU ALAM
P.O. BOX 2648
CAIRO, A.R.E.
Telex. 92564 ATLOZ UN/Phone 740181

2 July, 1980
File Reference SM1-094 A
AID Project No. 263-0084

Sinai Manganese Co.
1 Kasr El Neel Street
Cairo, ARE

Attention: Geol. Salah Demerdash, Contract Officer

Subject : Costs of Electric Power, Ferromanganese Producers Worldwide

Dear Geol. Demerdash,

Please reference our previous discussions about the sensitivity of project economics relative to the cost of electric power. As you know, our study will be predicated on use of locally-available natural gas, as the most economical and energy-effective way to produce the necessary electric power. Work done todate, including The Site Selection Report (10 May 1980) and the 23 May Desk Study, all confirm the necessity of establishing a reasonable price for natural gas.

One important consideration in establishing a cost for gas; and thus indirectly, for the power generated from it; is to compare power costs for existing ferromanganese producers, worldwide. Consequently, with the assistance of Mr. John Winterhaller of Satra Corporation, our special technical consultants, we have tabulated the current costs paid for electric power by other major ferromanganese producers. This tabulation is attached as Exhibit I, and indicates that power costs currently range from LE0.0049 (Norway) to LE0.0315 (Japan) per kilowatt hour, with an average cost of LE0.0178 per kwh.

It is most important to confirm availability and cost of the gas as soon as possible, and we solicit your assistance in arranging meetings with appropriate government agencies and ministries as soon as possible so as to discuss these vital aspects of your project. If availability and/or cost cannot soon be established with regard to natural gas in the Abu Zeneima area, we will have to calculate project economic feasibility over a range of possible costs for electric power and thus postpone a specific conclusion as to project viability until such factors are known.

Any help you can provide in eliminating such variables will strengthen the results of our study and result in a more conclusive Stage 1 Work Rport. We appreciate your continuing cooperation.

Sincerely yours,
Kaiser Engineers & Constructors, Inc.

John Sulzbach
Program Manager

Enclosures: (1)

JFS/rj

Received on 3/7/80
Aga

Distribution - Files - 121, 915
ACB
JFS
Oakland
Files
Greenwalt
Coope
Neumann

2 July 1980

Exhibit I

INTERNATIONAL SURVEY

ELECTRIC POWER COSTS PAID BY FERROALLOY PRODUCERS

	Costs/Kilowatt-Hour	
Country	$US	LE
Finland	0.035	0.0245
France	0.024	0.0168
Japan	0.045	0.0315
Norway (old contracts)	0.007	0.0049
Norway (new contracts	0.019	0.0133
South Africa	0.019	0.0133
Spain	0.024	0.0168
Sweden	0.024	0.0168
U.S.A.	0.025	0.0175
W. Germany	0.032	0.0224
Average Costs	0.0254	0.0178

Costs in dollars converted to Egyptian Pounds at 0.70.

6-17-80

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SATRACO NYK

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ATT R GREENWALT

ESTIMATED AVERAGE POWER PRICES AS FOLLOWS FOR FERROALLOY PRODUCERS
IN MILS PER KWHR:

FINLAND	35	
FRANCE	24	
JAPAN	45	
NORWAY	7	- OLD CONTRACTS
NORWAY	19	- NEW CONTRACTS
SOUTH AFRICA	19	
SPAIN	24	
SWEDEN	24	
USA	25	
W GERMANY	32	

RECEIVED
JUN 16 1980
Kaiser Engineers, Inc.
R. B. Greenwalt

REGARDS
J WINTERHALER
MACALLOY CORP
MB
KAISENGS OAK B

KAISER ENGINEERS

KAISER ENGINEERS AND CONSTRUCTORS INC
300 LAKESIDE DRIVE
POST OFFICE BOX 23210
OAKLAND, CALIFORNIA 94623 · CABLE KAISENCS

PLEASE ADDRESS REPLY TO
2 MOTI SABRY ABU ALAM
P.O BOX 2548
CAIRO, A.R.E
Telex 92564 ATLOZ UN/Phone 740151

H.E. Engr. Kamel El-Desouki, Chairman
Egyptian Electrical Authority
Heliopolis, ARE

5 April 1980

Subject : Electric Power Requirements, Sinai Ferromanganese Project

Your Excellency,

Please reference letter No. 56/80 dated 22nd March 1980 from the Sinai Manganese Company, introducing Kaiser Engineers as their consultant for the pre-feasibility study of a ferromanganese project at Abu Zeneima, Sinai. We are assisted in this study by our associates, the Arab Consulting Bureau, headed by Geol. Monir El-Kholy.

We wish to express our appreciation for the most useful and informative meeting held in Dr. Mustafa Suidan's office on 30 March 1980. As we explained at that time, we urgently need information relative to availability and costs of electric power for the proposed project, at the Abu Zeneima site, plus the two alternate sites at Suez and Idfu. Therefore we have prepared, and hereby submit to you, 3 copies of a questionnaire which outlines the anticipated schedule of demand, describes the characteristics of the power demand cycle, and defines the information required from the Egyptian Electrical Authority.

Because of the limited time available to complete our study work, we are requesting that the questionnaire be completed and returned to us by 30 April or sooner. To facilitate such completion we will be happy to return to your offices at any time convenient to you to discuss any or all of the electric power aspects of this project. Please feel free to phone us at 740-151 if there are any questions, or when the questionnaire is completed so we can send a representative to pick it up.

We wish to again thank you for the cooperation and help given thus far, and look forward to your continued assistance in the future.

Sincerely yours,
Kaiser Engineers & Constructors, Inc.

John Sulzbach
Program Manager

Encl. (3)
cc Sinai Manganese Co.

Never received an answer from EEA despite several follow up calls.

SINAI FERROMANGANESE PROJECT

ELECTRIC POWER REQUIREMENTS

QUESTIONNAIRE

1. Anticipated Demand

The anticipated power demand for the ferromanganese smelter project at Abu Zeneima, Idfu, or Suez is 30MVA. The basic load of 26.4MVA will be in the form of two (2) submerged arc electric furnaces each rated at 13.2MVA. The remaining load of 3.6MVA is for plant auxilliaries and townsite. The transformer capacity at each of the two furnaces will be 13.2MVA with a secondary voltage range of 90-130-120 volts by means of a tap changer. The maximum load at each furnace will be 9000 to 1000KW which will normally be simultaneous and continuous.

2. Operational Characteristics, Furnaces

The submerged arc electric furnaces will operate in the following manner:

After the furnace has been switched on, the load will slowly be increased within eight days from about 1000KW to about 3500KW. During this period the baking of the electrodes and the drying out of the furnace lining will take place. After 8 days and an accumulated load of approximately 400,000KWh the furnace is gradually filled up with raw materials. The first tapping may take place after 10-11 days with approximately 700,000KWh accumulated. After about 16 days, the furnace is completely filled up, regular and stable tappings are established and the furnace load has reached the estimated maximum of 9-10,000KWh. Only minor current variations of approximately 10% are expected after optimum electrical conditions are established.

Annual operating time figure is approximately 96%. Routine measurements of electrode length may take place once a week with the furnace switched off for 30-60 minutes.

Programmed main overhaul may amount to 1-2 weeks per year. Relining of the furnace hearth may be necessary after 6-8 years of operation and would require normally about 1 month.

3. Schedule of Demand
The approximate schedule of power demand for the 3 locations is projected to occur as follows:

(a) Suez or Idfu - The initial furnace unit is to begin operation in 1985 and the second furnace unit is to begin operation in 1986. It is anticipated that both furnaces will be at full load by the end of 1987.

(b) Abu Zeneima - Here the site already is confirmed, and the existing furnace can be rehabilitated and put into operation sooner than a new furnace can be built at the other two sites; so initial demand would begin in 1983, with the second furnace coming into production in 1985 and full load of 30MVA required thereafter.

4. Plant Locations
Except for Abu Zeneima, locations are necessarily based on best current information as to available and logical sites.

(a) Abu Zeneima - The existing smelter building is about one kilometer west of the highway (Suez-Abu Rudeis) and thus very close to likely right-of-way for any HT transmission line extended down the coast.

(b) Suez - Site is expected to be in the industrial zone, south of Suez City, approximately 4 km north of the port at Adebia and about 2 km west of the coast of the Gulf of Suez.

(c) Idfu - Site is expected to be about 10 km east of the Nile River, beyond the agricultural zone, and adjacent to the Idfu-Red Sea road.

5. Availability of Supply
Please advise source and availability of power in terms of quantities required and the projected schedule of demand; for each of the 3 candidate sites of Abu Zeneima, Idfu and Suez.

6. Costs of Connections
For each of the 3 sites, please describe the equipment and transmission line that the EEA would need to install to connect from high-tension transmission line to the substation within the project boundary, and what the costs would be to the project. For example, we assume that the EEA would install switch gear and/or transformers plus

...../

perhaps additional breaker protection before power goes to plant transformers in our plant substation. However, we prefer your description of these connections, and to define for us the interface between installations made directly by EEA and ourselves. We understand that connection costs are paid by projects, so we need a complete description of how such costs are finally repaid to EEA.

JFS/vh
5 April 1980

INTEROFFICE MEMORANDUM

FILE

1 April 1980

cc. A. Wallach
R. Palmer
J. Tilt
G. Aiken
G.F. Coope
R. Greenwalt
D. Neumann
Satra
ACB
File, Oakland

John Sulzbach

Job 80012
Sinai Ferromanganese Study

Electrical Power Rate Structure

On 30 March, Monir El-Kholy, F. Coope, R. Greenwalt and writer, met with Mr. Hassan Abdulah, Manager of Commercial Affairs, Egyptian Electrical Authority, at their offices in Heliopolis, to discuss costs of electric power relative to our project.

General

Since the EEA facilities are being financed by the World Bank, they are required to establish rates guaranteed to return at least 9% for debt service. Thus, since 1975, a unified basic rate structure has been in effect for the whole power network in Egypt, established by Ministerial Decree No. 259-1974.

This basic rate is calculated on a cost equivalent of L.E. 7.5/ ton of " mazut " fuel, which amounts to a direct subsidy on power costs, since the current price for mazut is around L.E. 110/ton. Variations on the basic rate, which greatly increase cost to consumer, are applied for Law 43 joint-venture companies. These variations are calculated by a formula which takes into account the current international price for fuel (mazut).

Rate Calculations

The 4 rate structures possible under the EEA regulations can be developed as follows, assumming L.E. 110/ton for current international fuel price, and assumed feed at 220/132 KV:

1. Basic Rate - Public & Private Sector Firms

The basic rates are defined in the 2-page rate structure description given us on 30 March, and attached hereto. This rate applies to all public and private sector Egyptian companies, without any restriction on their product prices.

Applicable rate = 5.072 million/Kwh=7.25 mills/Kwh.

2. Basic Rate - Law 43 Foreign JV Firms

The basic rate will still be applied if the company agrees to accept government price controls on its products. If the company is only accepting management/operational assistance, foreign equipment, training help, etc. Then the low basic rate would definitely apply (but so would onerous government regulations on labor, etc.). If equity of foreign partner is actually share capital, then they would have to accept the product price controls to get the low rate.

Applicable rate =5.072 million/Kwh=7.25 mills/Kwh

3. Moderate Rate - Law 43 Foreign JV Firms

This rate applies to firms who produce for domestic consumption. A fuel-influence additive rate is calculated as follows, and added to basic rate to get total cost to consumer :

Additive Formula = (fuel price/ton - 7.25) x 0.4 millemes

(110-7.5) x .4 = 41.000 millemes fuel additive

plus 5.072 basic rate

Applicable rate = 46.072 millemes = 65.82 mills/Kwh

4. Highest Rate - Law 43, Foreign JV Firms

This rate applies to firms who produce for export. The rate is composed of higher base rates plus the formula for influence of cost of international fuel. In addition, the customer must pay a fixed annual demand charge, varying according to voltage delivered. These higher base rates and demand charges are listed on a handwritten sheet (attached) given to us at the 30 March meeting. Assuming 40,000 Kw demand rate :

Fixed Annual Demand charge = 15.290x28,000 Kw=LE 428,120
($ 611,600)

Power rate = 8.15 millemes, base rate
plus 41.00 millemes, fuel influence additive

Applicable
rate =49.15 millemes = 70.21 mills/Kwh.

Power Factor Adjustments

Two major categories exist :

1. Local/Public Sector, & JV with Controlled Prices (basic rates)

Power factor bonus or penalty charge is calculated as percentage of the basic rate per Kwh.

With PF = 100-90%, bonus of 0.5% per 1% differential
= 90-80%, no bonus or penalty
= 80-60%, penalty of 0.5% per 1% differential
= below 60%, penalty of 1.0% per 1% differential, plus must install capacitance to improve the power factor.

2. Law 43, Foreign JV Firms (moderate & highest rates)

Power factor penalty is calculated as percentage of the applicable power rate/Kwh.

With PF = 100-90%, no penalty or bonus.
= 90-70%, penalty of 0.5% per 1% differential.
= below 70%, penalty of 1% per 1% differential, plus must install capacitance to improve the power factor.

EEA Purchase of Power and/or Facilities

Were told that generally the EEA would not buy an existing plant (say in an area recently included in grid network coverage). Neither do they buy excess power from private plants to boost their capscity.

Costs of Switch Gear, Transformers & Hookup Power Lines

These costs are established by another department, but generally all such costs are back-charged to the particular project. It is likely that EEA would either build themselves, or supervise installation to their specifications.

1 - First 70 000 K.W.H. annually at 20.347 milim/K.W.H.
2 - Next 100 000 K.W.H. annually at 16.647 milim/K.W.H.
3 - Excess over at 15.847 milim/.K.W.H.

5 - Moving power mentioned in items 3 and 4 means that energy is used in :

A - Industrial moving power perposes.
B - Moving power for :

1 - Agriculture (irrigation-drainage-Land reclamation).
2 - Electric traction.
3 - Utilities (water, sewage, others).

C - Other uses of moving power as elevators, central air conditioning and others.

Received by hand from Hassan Abdulah, Manager of Commercial Affairs for EEA, in their offices on 30 March 1980

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Kaiser Engineers, Inc.
J. F. Sulzbach

Selling prices for energy consumtion according to Ministerial Decree no. 259-1974

1 - Consumers fed on very high voltage (220/132 K.V.) are charged : 5.072 millim/K.W.H.

2 - Consumers fed on high voltage (66/33 K.V.) are charged : 6.464 millim/K.W.H.

3 - Consumers fed on midium voltage for moving power and whose contracted power exceeds 500 K.W. (625 K.V.A.) are charged as follows :

a- Fixed annual tariff : Annual fixed charge 5.620 L.L./K.W. for contracted power .

b- Annual escalated tariff :

- First 1000 hours X maximum contracted power (K.W.) base price 7.105 m. + fuel factor 2.998 m.=10.103 M/K.W.H.
- Next 500 hours X maximum contracted power (K.W.) base price 6.505 m. + fuel factor 2.998 m.=9.503M/K.W.H
- Next 1000 hours X maximum contracted power (K.W.) base price 5.305 m + fuel factor 2.998 M= 8.303M/K.W.H.
- Next 1000 hours X maximum contracted power K.W. base price 4.105 m + fuel factor 2.998 m.=7.103 M./K.W.H.
- Next 1500 hours X maximum contracted power (K.W.) base price 2.405m. + fuel factor 2.998 M.=5.403 M./K.W.H.
- Any other increase of consumption untill the end of the year . base price 1.605 m. + fuel factor 2.998 m.=4.603M./K.W.H.

4 - Consumers fed on meduim or low voltage for moving power whose contracted power 500 K.W. or less are charged as follows :

J 55

	Fixed annual demand charge L.E/K.W.	mellim/K.W.H.
Very High Tensions	15.290	8.150 + the influence of international price of fuel
High "	16.000	9.465 + "
Medium voltages:		
more than 500 K.W.	24.230	12.470 + "
500 K.W. or less	6.000	15.940 + "
Low voltage	—	23.150 + "

Prices for firms within Law 43 and/or located in Free Zone, producing products for export.

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PROCESS PLANT PRODUCTION SCHEDULE

Production is initiated at the conclusion of the 24-month project implementation schedule. The smelter furnace is brought into full production over a three year span with the following percentage annual outputs of metal projects, compared to full nominal production rates:

Year	Pig Iron	FeMn
1	75%	50%
2	95%	80%
3	100%	100%

The annual tonnage will necessarily be adjusted for the Mn grade and Mn/Fe ratio of the ore reserves treated. The initial year's production reflects the two months of plant commissioning including the gradual furnace heatup period for baking of electrodes and curing of refractories.