

# Project Profile

## BASIC INFORMATION

### Project title

132kV Overhead Pole Line and Underground Cables from Tung Chung Town Substation to Cheung Sha Substation.

### Purpose nature of the project

The current electricity supply on Lantau Island relies on separate network systems of 33kV and 132kV. In order to improve supply security and to meet the future load growth, the existing 33kV supply system on Lantau Island will gradually be phased-out in stages. This project will involve installation of a 132kV circuit from the existing Tung Chung Town Substation to the existing Cheung Sha Substation.

The project will make use of the majority portion of the existing 33kV overhead line between Tung Chung Town Substation and Cheung Sha Substation. Stronger standard designed 132kV poles will be utilised to replace the existing obsolete 33kV supports, hence number of supports will be reduced substantially.

This project profile covers the proposed installation of 132kV transmission link from Tung Chung Town Substation to Cheung Sha Substation on Lantau Island in order to maintain a secure supply to the existing and serve future load growth at South Lantau.

### Name of project proponent

CLP Power Hong Kong Limited

### Location and scale and history of site

The proposed overhead line commences from Tung Chung, runs along the ridges to Cheung Sha, follows majority of the existing alignment of the 33kV overhead line. The two ends of the overhead line are linked to the existing substations by underground cables with outer diameter of about 80mm-100mm. The total route length of the proposed overhead pole line and underground cables are about 6.0 km and 2.5 km respectively. The detail of the proposed route of the project is shown on the 1: 10,000 scale route map drawing no. 24450/RF1412-4 in Attachment 1.

The overhead pole line will consist of bare aluminium conductors supported on tubular steel poles of average span of 120 metres. It will have approximately 30% single pole supports and 70% H-pole supports similar to those as shown on Drg. Nos. T GEN 51520 D E33 3000 01 I, T GEN 51520 D E33 3001 01 I and T GEN 51520 D E33 300201 I in Attachment 2.

## **Number and type of designated projects to be covered by the project profile**

In accordance to Section Q1, Schedule 2 of EIA Ordinance, the project is classified as designated project as part of the Overhead Line need across the Country Park. This project covers two sections of underground cables plus one section of overhead line from Tung Chung Town Substation to Cheung Sha Substation.

## **Name and telephone number of contact person(s)**

(Projects Manager – West)  
(Safety Health & Environment Manager)

## **OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **Project Planning and Implementation**

The proposed route is planned with consideration of land usage constraints, technical feasibility, safety & health and environmental aspects by the in-house engineers. A preliminary route proposal has been circulated to relevant government departments and other concerned parties together with local villagers for comments. The submitted route has been modified to cope with the relevant comments. In addition, light-type pole structure instead of lattice pylon will be used so as to minimise land occupation area and potential visual impact.

In brief, the following options were considered and reviewed before this route has been finalised.

1. Underground cables along existing Tung Chung Road is precluded due to long duration blockage for cable laying that would produce adverse effect to the existing traffic condition.
2. Submarine cables skirt around coastal of Lantau Island or cables tunnel is remote to justify by cost.
3. Stronger standard designed 132kV poles will be utilised to replace the existing 33kV poles, the number of poles will be reduced substantially. Hence, the overall impact to the existing environment is considered only minimal or even have beneficial effect.

Consultant will be employed to carry out the EIA study whilst in-house and contractor resources will be employed to implement this project.

## Proposed Time Schedule

Outline programme for the proposed project is as follows :-

1. Application for an EIA Study Brief	Apr 2000 – May 2000
2. Tender-assessment-award contract for EIA Study	May 2000 – June 2000
3. EIA Study	Jul 2000 – Dec 2000
4. Submission of EIA Report for approval	Jan 2001 – Apr 2001
5. Application for Country & Marine Parks Authority approval	May 2001 – Jul 2001
6. Application for Town Planning Board approval	May 2001 – Jul 2001
7. Application for Environmental Permit	Jul 2001 – Aug 2001
8. Manufacturing & delivery of material	Sep 2001 – Jan 2002
9. Pole erection & conductor stringing	Feb 2002 – Jan 2003
10. Underground Cables laying	Feb 2002 – Jan 2003
11. Circuit up-rating complete and start operation	Feb 2003

## Interactions with broader programme

The above programme is scheduled to match with the existing 33kV system phasing-out on Lantau Island in order to strengthen the supply security and improve the system performance.

## MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

Majority of the overhead line material will be delivered to the sites by helicopter whilst cable will be delivered by lorry through the existing access road as far as practicable. Hand-dig method will be applied for the overhead pole line foundation work unless it becomes impracticable such as rock or concrete breaking involved. Excavator and powered mechanical equipment will be employed during the cable trench work. Winch will be used for the overhead line and underground cable laying.

There is one cable section across the stream of Wong Lung Hang by using the access road over the stream, hence, the cable laying work would not affect the stream. Moreover, the proposed transmission line might have no impact on the water catchment area at Cheung Sha side.

Base on the routing of the proposed transmission line, three major sensitivity receivers are identified at this stage:-

- The Lantau North and South Country Parks where the existing 33kV overhead line runs through.

- The proposed Tung Chung end transmission line is located at the area of Tung Chung New Town where some new residential buildings are being developed
- Regarding the terminal pole at Cheung Sha, it is located at about 25 metres (horizontal distance) away from the low density residential area.

For detail, please refer to the attachment 1.

## **POSSIBLE IMPACT ON THE ENVIRONMENT**

### **Major activities and related environmental aspects**

In accordance with the previous experience, no any significant environmental impacts were recorded due to the construction of 132kV overhead pole lines and underground cables. Whilst, some possible environmental impacts worth to be concerned are listed as the followings.

- Low level of noise or limited amount of dust may be generated during the excavation and trenching work for overhead pole line and underground.
- Limited tree pruning and / or felling at modified section of original route to keep a minimum clearance of 3.9 metres between tree canopy and the conductors for safety reasons.
- Due to re-use of majority of the original 33kv overhead line alignment, only minor ecological impact to the present nature is expected.
- With regards to EMF concerns, electric and magnetic field generated from the proposed circuit shall comply with Supply Rule and will not exceed 5kV/m and 0.1 millitesla (r.m.s) respectively. This also fulfils the guidance recommended by ICNIRP in 1998. Attachment 3 shows the predicted EMF figures for the proposed 132kV circuit.
- Upon commissioning of the project, the number of 33kV poles in the system will be reduced and hence beneficial effect to the existing visual impact is expected.

## **ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS**

The following measures will be incorporated in the design stage to minimise environmental impacts:

- Good site management practice such as covering the stockpile by plastic sheet would be applied for the excavation of footings (1.2m x 1.2m x 2.95m depth) for overhead pole line and trenching (1.05m width with 1.2m-1.6m depth) for underground cables to minimise the potential dust emission on site.
- Base on the proposed transmission line route and location of identified sensitive receivers, the noise impact due to the site work is only minimal. Noise label would be applied to all the powered mechanical equipment and night-time work would be restricted at these locations.
- Work area / site will be restored to original nature as far as practicable.
- When tree felling is unavoidable, appropriate species will be re-vegetated upon it is agreed with AFD.
- Pole will be painted with antique colour on the original hot dip galvanized dull grey colour surface if required (It was requested by AFD in some previous similar projects).
- About 15km with 168 supports of existing 33kV overhead lines will be removed upon commissioning of the proposed 132kV overhead line. As a result, there will have beneficial effects on visual appearance on Lantau Island.
- The 'Recommended Pollution Control Clauses for Construction Contracts' as promulgated by EPD will be implemented.
- Any environmental mitigation measures recommended in the EIA report will be followed.
- Depend on the recommendation of EIA study, the proposed alignment could allow minor adjustment to minimise the possible environmental impact as far as practicable.

## **USE OF PREVIOUSLY APPROVED EIA REPORT**

Not applicable.

**- END -**

## **ATTACHMENT 1 – Route Map**

### **附件 1 —— 定線圖**

#### **Route map in 1:10,000 scale**

路線圖（比例 1:10,000）

#### **Drawings Nos. 24450/RF1412-04**

圖則編號：24450/RF1412-04

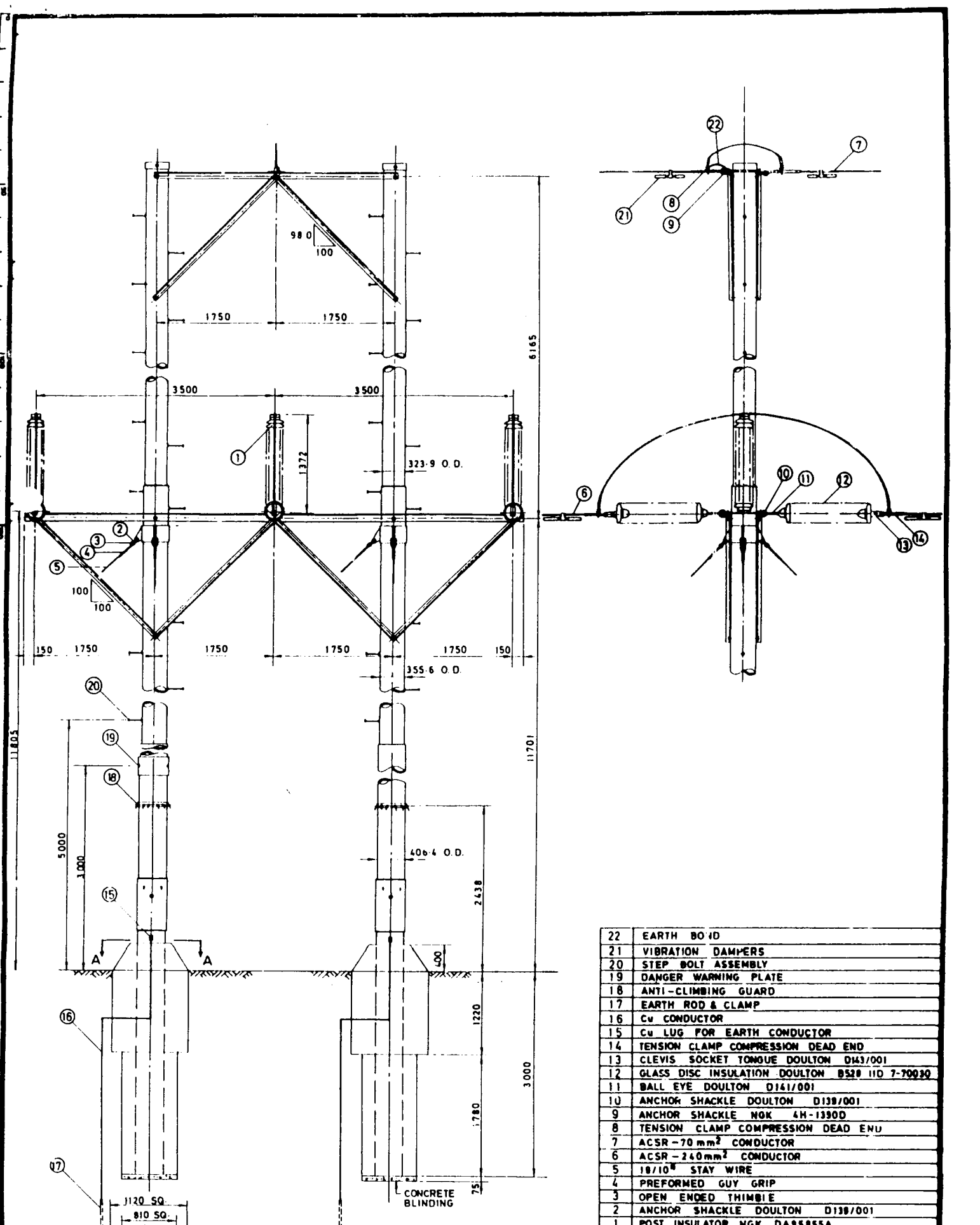
*For the original A1-size drawing (attachment 1), please visit the EIAO Register Office or EPD resources centres as listed on advertisement notice.*

如要閱覽此 A1 原稿圖（附件 1），請親臨  
環境影響評估條例登記冊辦事處或  
廣告上所列之環保署資源中心。

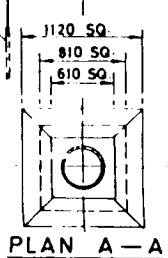
## ATTACHMENT 2 – Elevation Plan of Poles


### 附件 2 —— 桿柱立視圖

<b>Pole Type</b> 桿柱類別	<b>Drawing No.</b> 圖則編號
<b>H- Pole</b> H 型桿	<b>T GEN 51520 D E33 3000 01 A I</b> T GEN 51520 D E33 3000 01 A I
<b>H-Pole</b> H 型桿	<b>T GEN 51520 D E33 3001 01 A I</b> T GEN 51520 D E33 3001 01 A I
<b>Single Pole</b> 單桿	<b>T GEN 51520 D E33 3002 01 A I</b> T GEN 51520 D E33 3002 01 A I



22	EARTH BO'ID
21	VIBRATION DAMPERS
20	STEP BOLT ASSEMBLY
19	DANGER WARNING PLATE
18	ANTI-CLIMBING GUARD
17	EARTH ROD & CLAMP
16	Cu CONDUCTOR
15	Cu LUG FOR EARTH CONDUCTOR
14	TENSION CLAMP COMPRESSION DEAD END
13	CLEVIS SOCKET TONGUE DOULTON D143/001
12	GLASS DISC INSULATION DOULTON B528 IID 7-70030
11	BALL EYE DOULTON D141/001
10	ANCHOR SHACKLE DOULTON D139/001
9	ANCHOR SHACKLE NGK 4H-1330D
8	TENSION CLAMP COMPRESSION DEAD END
7	ACSR - 70 mm <sup>2</sup> CONDUCTOR
6	ACSR - 240 mm <sup>2</sup> CONDUCTOR
5	18/10 <sup>#</sup> STAY WIRE
4	PREFORMED GUY GRIP
3	OPEN ENDED THIMBLE
2	ANCHOR SHACKLE DOULTON D139/001
1	POST INSULATOR NGK DA95855A

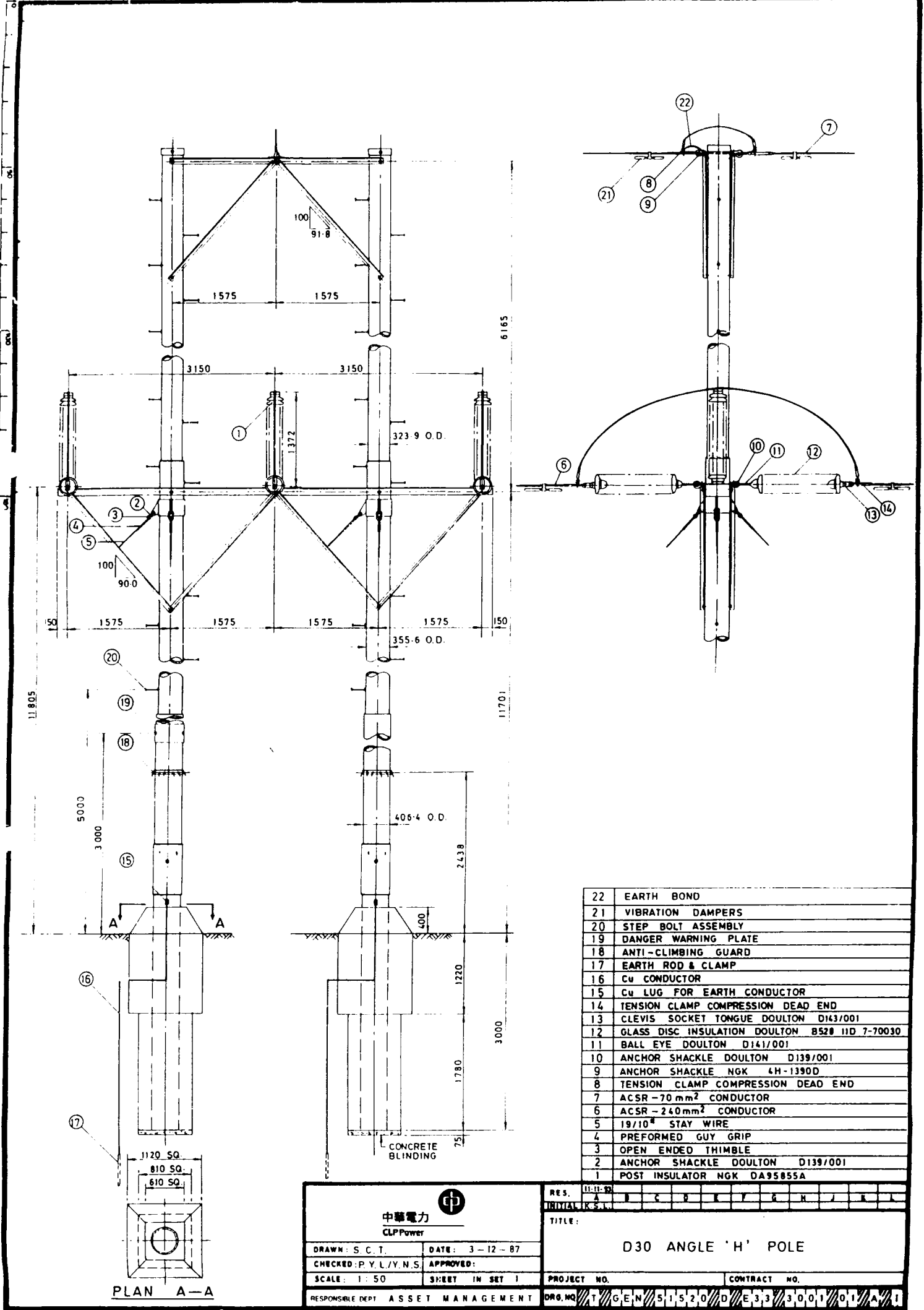


  
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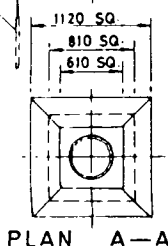
DRAWN: S. C. T.	DATE: 2-12-87
CHECKED: P. Y. L./Y. N. S.	APPROVED:
SCALE: 1:50	SHEET IN SET 1
RESPONSIBLE DEPT. ASSET MANAGEMENT	

RES. 12-11-87	INDICATOR S. L.
TITLE: D60 ANGLE / TERMINAL 'H' POLE	
PROJECT NO.	CONTRACT NO.
DRG. NO. T/GEN/S/520/D/E/3/3000/01/A71	






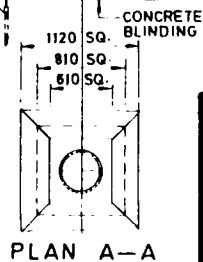
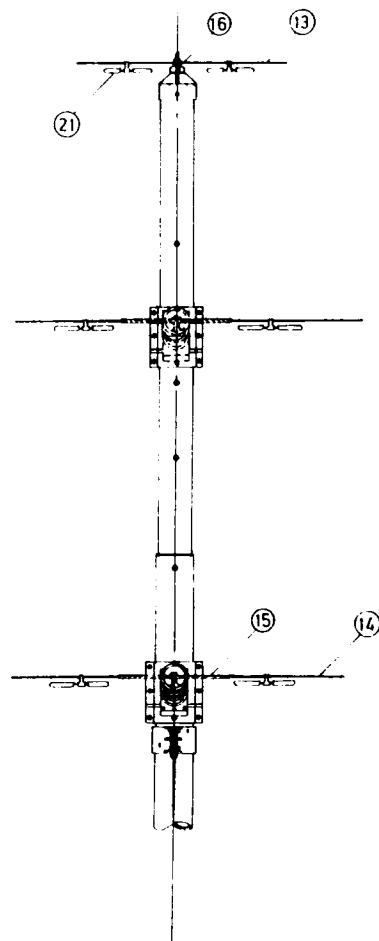
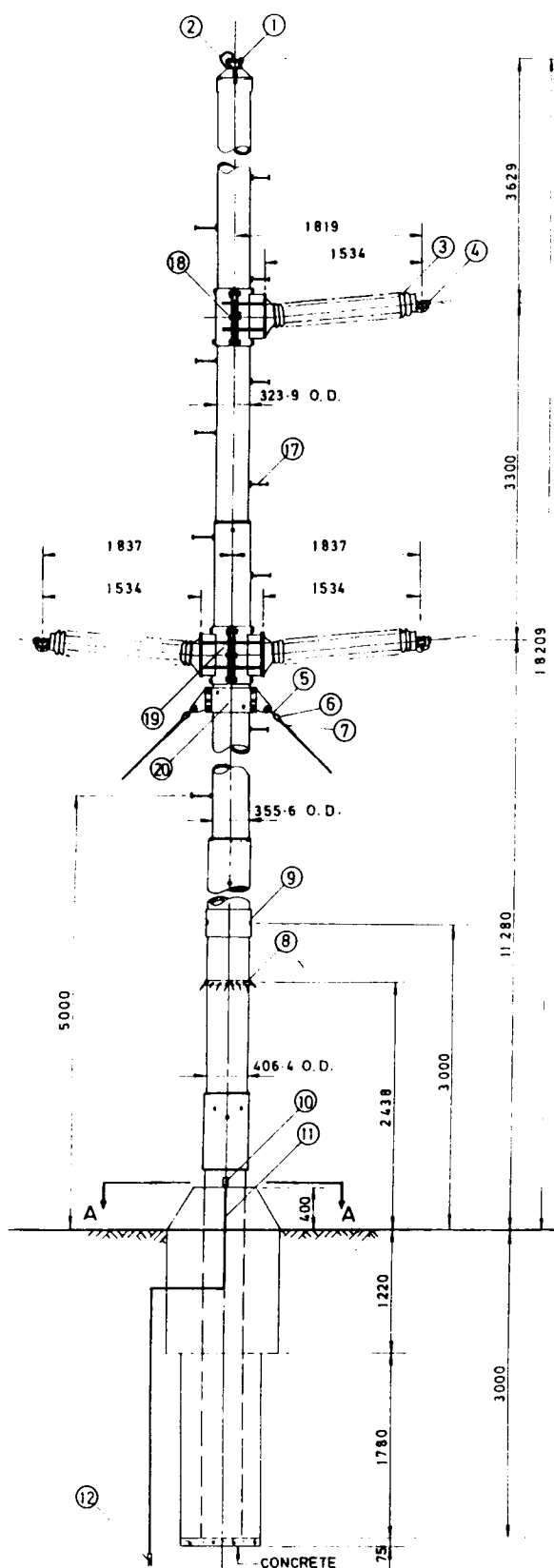
22	EARTH BOND
21	VIBRATION DAMPERS
20	STEP BOLT ASSEMBLY
19	DANGER WARNING PLATE
18	ANTI-CLIMBING GUARD
17	EARTH ROD & CLAMP
16	Cu CONDUCTOR
15	Cu LUG FOR EARTH CONDUCTOR
14	TENSION CLAMP COMPRESSION DEAD END
13	CLEVIS SOCKET TONGUE DOULTON D143/001
12	GLASS DISC INSULATION DOULTON B52# IID 7-70030
11	BALL EYE DOULTON D141/001
10	ANCHOR SHACKLE DOULTON D139/001
9	ANCHOR SHACKLE NGK 4H-1390D
8	TENSION CLAMP COMPRESSION DEAD END
7	ACSR-70 mm <sup>2</sup> CONDUCTOR
6	ACSR-240 mm <sup>2</sup> CONDUCTOR
5	19/10 <sup>#</sup> STAY WIRE
4	PREFORMED GUY GRIP
3	OPEN ENDED THIMBLE
2	ANCHOR SHACKLE DOULTON D139/001
1	POST INSULATOR NGK DA95855A



PLAN A-A

 中華電力 CLP Power	
DRAWN: S. C. T.	DATE: 3-12-87
CHECKED: P. Y. L./Y. N. S.	APPROVED:
SCALE: 1:50	SHEET IN SET 1
RESPONSIBLE DEPT: ASSET MANAGEMENT	

RES. 11-11-80														
INITIAL K.S.L.														
TITLE:	D30 ANGLE 'H' POLE													
PROJECT NO.												CONTRACT NO.		
DRG. NO.	T GEN 51520 D E 33 3001 01 A 1													



21	VIBRATION DAMPERS
20	STAY CLAMP ASSEMBLY
19	LINE POST INSULATOR SUPPORT (DOUBLE)
18	LINE POST INSULATOR SUPPORT (SINGLE)
17	STEP BOLT ASSEMBLY
16	AL. LINE TAP
15	PREFORMED LINE GUARD
14	ACSR-240mm <sup>2</sup> CONDUCTOR
13	ACSR-70mm <sup>2</sup> CONDUCTOR
12	EARTH ROD & CLAMP
11	CU CONDUCTOR
10	CU LUG FOR EARTH CONDUCTOR
9	DANGER WARNING PLATE
8	ANTI-CLIMBING GUARD
7	PREFORMED GUY GRIP
6	OPEN ENDED THIMBLE
5	ANCHOR SHACKLE DOULTON D139/001
4	TOP CLAMP 1H-1170AU
3	LINE POST INSULATOR NGK DA85705G
2	EARTH BOND
1	EARTH WIRE HOLDER

中華電力	CLP Power
DRAWN: S.C.T.	DATE: 4-12-87
CHECKED: P.Y.L./Y.N.S.	APPROVED:
SCALE: 1:50	SHEET IN SET: 1
RESPONSIBLE DEPT: ASSET MANAGEMENT	

RES.	12-11-93																			
INITIAL	K.S.L.																			
TITLE:		INTERMEDIATE SINGLE POLE																		
PROJECT NO.										CONTRACT NO.										
DRG. NO. TYP GEN 51520 DE 33 3002 01 A 1																				

## **ATTACHMENT 3 – Prediction of EMF**

### **附件 3 — 電磁場預測**

**Comparison tables demonstrate that the predicted values will be well under the stipulated guideline limits issued by the ICNIRP in 1998.**

比較圖表顯示電磁場預測值將遠較國際非電離輻射防護委員會一九九八年指引中所規定的限值為低。

## **ATTACHMENT 3**

Guidelines on limits of exposure to power frequency EMF were issued by the International Commission on Non-ionizing Radiation Protection (ICNIRP) in 1998. The guidelines were recognised by both the World Health Organisation and the Hong Kong SAR Government. CLP Power has adopted the guidelines in total. EMF generated from the proposed overhead line shall comply with the guidelines as in Table 1 below.

**Table 1 Guidelines on Limits of Exposure to 50Hz Power Frequency Electric and Magnetic Fields Issued by ICNIRP**

<b>Exposure Characteristics</b>	<b>Electric Field Strength kV/m (rms)</b>	<b>Magnetic Flux Density Millitesla (rms)</b>
<b>Occupational</b> Continuous	10	0.5
<b>General Public</b> Continuous	5	0.1

### **Prediction of EMF**

The calculated values on maximum loading basis are shown in the following Table 2.

**Table 2 Electric and Magnetic Field Calculated for the Proposed 132kv Overhead Line from Tung Chung Town Substation to Cheung Sha Substation**

<b>Circuit Name</b>	<b>System Voltage</b>	<b>Current</b>	<b>Height of Bottom Conductor from Ground Level</b>	<b>Electric Field Strength kV/m (rms)</b>	<b>Magnetic Flux Density millitesla (rms)</b>
Tung Chung Town S/S – Cheung Sha S/S	132kV	656A	6.7m	1.96	0.0202

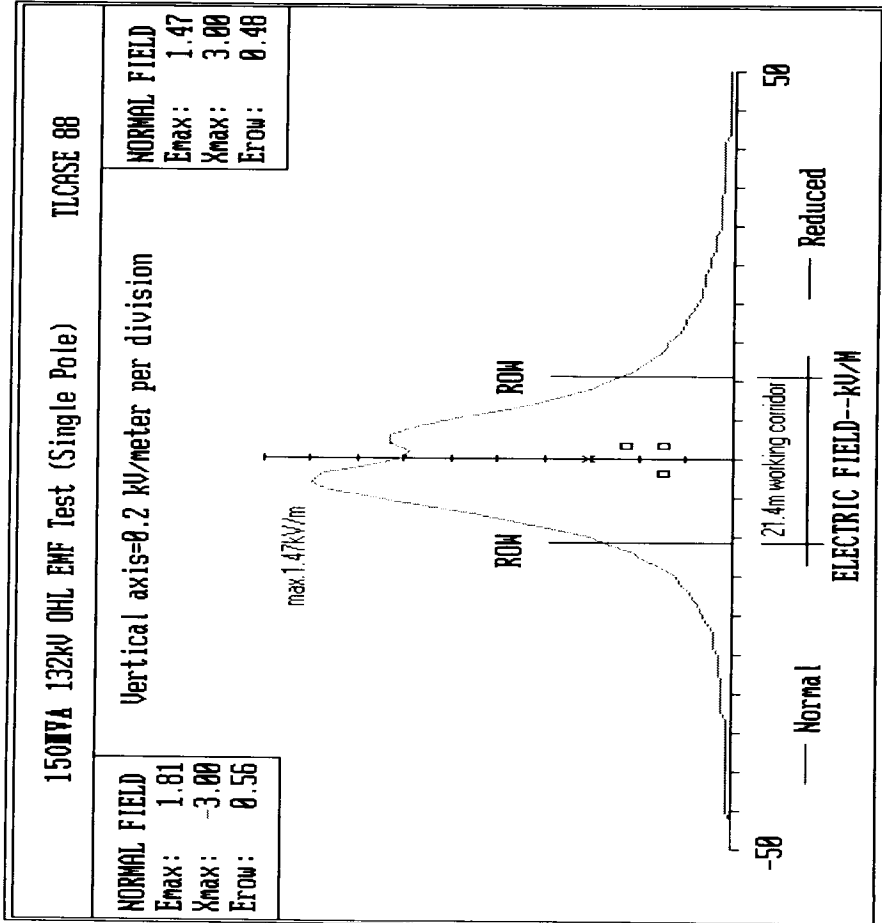
The calculation is based on the assumptions of maximum loading conditions and that the typical pole configuration with the bottom conductor is at the minimum safety clearance from ground level of 6.7m. Calculation format for EMF values are acceptable to Electrical & Mechanical Services Department.

The EMF profiles for both H-Pole and single pole are shown in attached figures, (a) & (b), which indicate the maximum electric field (1.96kV/m) generated from the proposed overhead line is underneath the conductors while maximum magnetic field (0.0202 Millitesla) is at the centre of the circuit. EMF are the strongest close to the overhead line and diminish with distance and no effect is envisaged outside the working corridor.

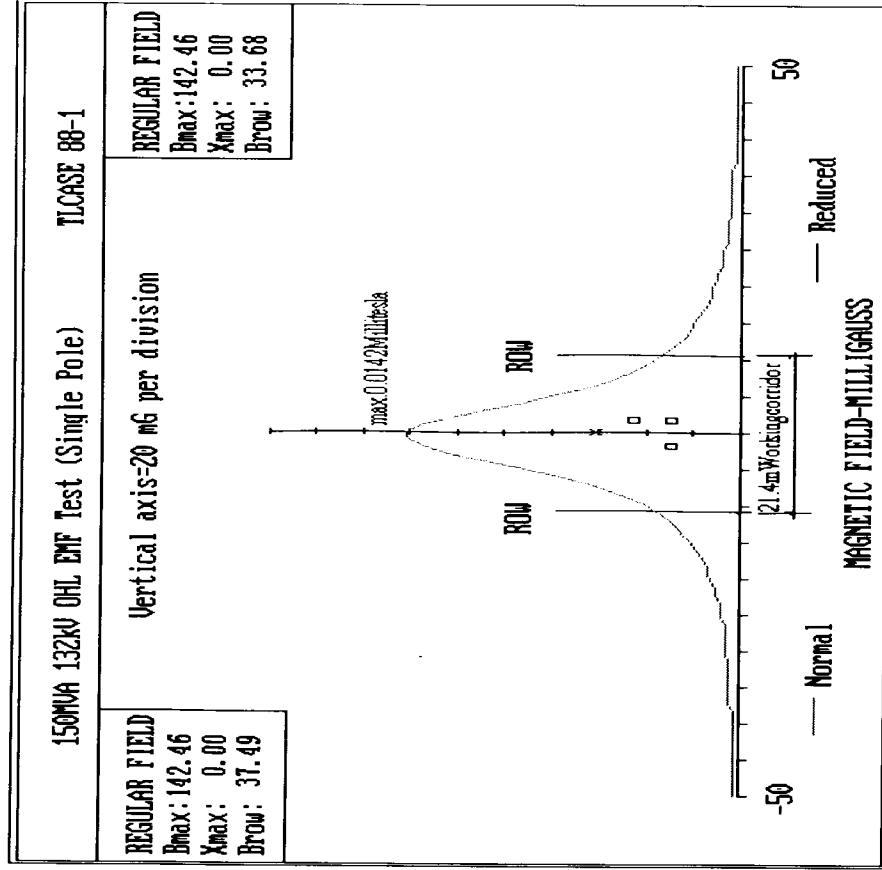
### **Conclusion of the Predicted EMF effect**

The calculations of EMFs for the proposed overhead line demonstrated that the predicted values will be well under the stipulated guideline limits (below 2/5 of guideline limits) issued by the ICNIRP. As such, the existence of EMF associated with the proposed project is not anticipated to pose any adverse impacts on public health.

**(a) Calculated EMF Profile for single-pole Configuration**

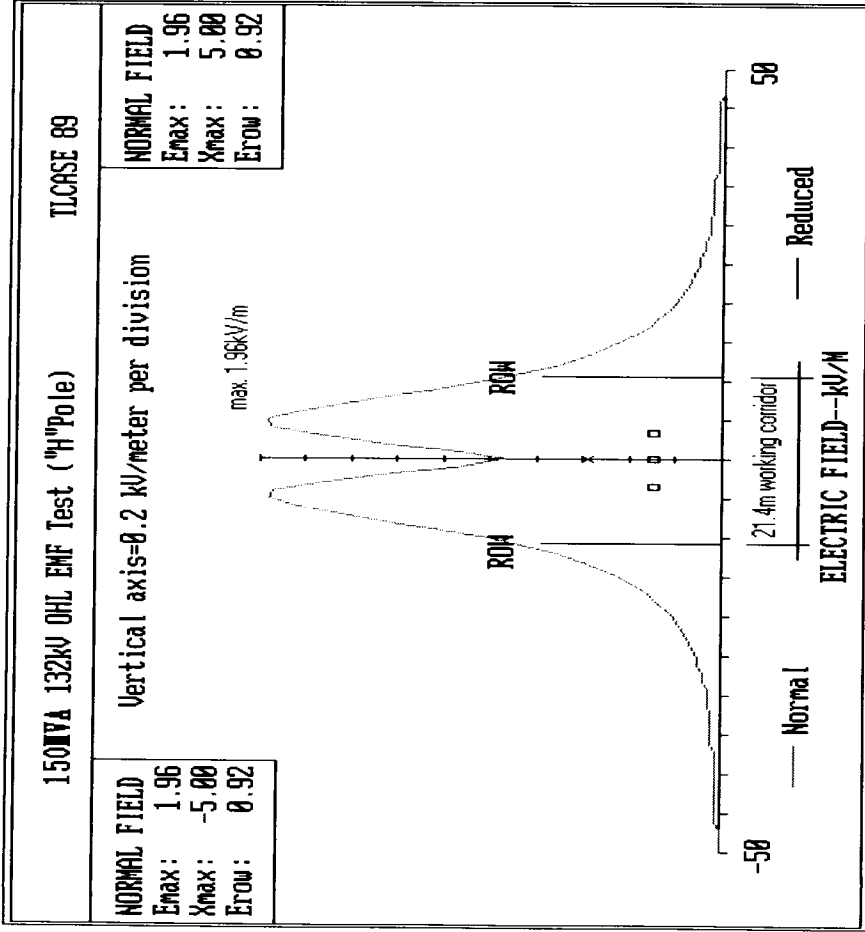


**Calculated Electric Field Profile**

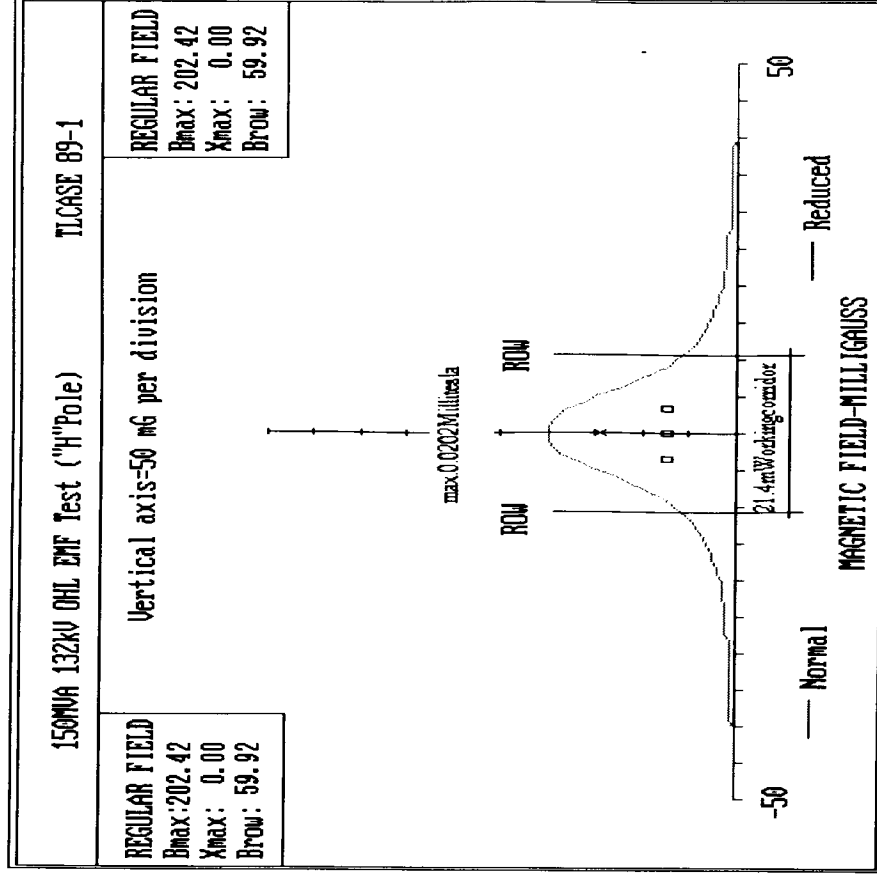


**Calculated Magnetic Field Profile** 0.1 Millitesla = 1000mG

**(b) Calculated EMF Profile for H-pole Configuration**



**Calculated Electric Field Profile**



**Calculated Magnetic Field Profile**    0.1 Millitesla = 1000mG