

## وزارة الكهرباء والطاقة المتجددة

قرار وزارى رقم ٢٢٢ لسنة ٢٠٢٠

صادر بتاريخ ٨/١١/٢٠٢٠

### وزير الكهرباء والطاقة المتجددة

بعد الاطلاع على قانون الكهرباء الصادر بالقرار بقانون رقم ٨٧ لسنة ٢٠١٥

ولائحته التنفيذية ؛

وعلى النظام الأساسى للشركة المصرية لنقل الكهرباء ؛

وعلى مذكرة رئيس مجلس إدارة الشركة المصرية لنقل الكهرباء بتاريخ ٦/١٠/٢٠٢٠ ؛

### قرر :

**مادة ١ -** يتم تنفيذ وإقامة وشد الموصلات للأبراج أرقام (٣٠، ٤٥، ٤٦، ٥٧،

٥٨، ٥٩، ٦٩، ٧٠، ٧١، ٧٢، ٧٣، ٧٤، ٧٥) لعملية إنشاء الخطين الكهربائين

(توليد الشباب / الملاك) ، (توليد الشباب / الجعفرية) جهد ٦٦ ك.ف بمحافظة

الإسماعيلية بالقوة الجبرية وذلك على الأرض التى يمر بها هذان الخطان طبقاً للمسار

الموضح بالخريطة المساحية وكشف الملاك الظاهرين والرسومات الهندسية المرفقة ،

ويكون التنفيذ على النحو التالى :

م	رقم البرج	طراز البرج	أبعاد الحفر بالمتر	الارتفاع بالمتر	عدد الأرجل	المحافظة
١	٣٠	E30+5	٢٥×١٧	٣٧	٤	الإسماعيلية
٢	٤٥	E	٢٠×١٣	٣٢,٧٥	٤	
٣	٤٦	E60+5	٢٧×١٨	٣٨,٣	٤	
٤	٥٧	ET45	٢٥×١٧	٣٣,٣	٤	
٥	٥٨	EPT45	٣٣×٩	١٦,٦	٤	
٦	٥٩	ET45	٢٥×١٧	٣٣,٣	٤	
٧	٦٩	E	٢٠×١٣	٣٢,٧٥	٤	
٨	٧٠	E	٢٠×١٣	٣٢,٧٥	٤	
٩	٧١	E	٢٠×١٣	٣٢,٧٥	٤	
١٠	٧٢	E	٢٠×١٣	٣٢,٧٥	٤	
١١	٧٣	E	٢٠×١٣	٣٢,٧٥	٤	
١٢	٧٤	E	٢٠×١٣	٣٢,٧٥	٤	
١٣	٧٥	E30	٢٥×١٧	٣٢	٤	

أعمال حفر القواعد للأبراج .

أعمال إحلال التربة للأبراج .

أعمال الخرسانة العادية والمسلحة للأبراج .

أعمال عزل بالبيوتامين للأبراج .

تركيب الحديد العلوى للأبراج .

أعمال شد الموصلات وتركيب العازلات للأبراج وسلك أرضى .

**مادة ٢ -** ينشر هذا القرار وملحقاته فى الوقائع المصرية ، وعلى جميع

المختصين تنفيذه .

وزير الكهرباء والطاقة المتجددة

**دكتور / محمد شاکر المرقبى**

## كشف

### أسماء الملاك والحائزين الظاهرين للأراضي المار بها

الخطان الكهربائيان (توليد الشباب / الملاك) ، (توليد الشباب / الجعفرية)

جهد ٦٦ ك.ف بمحافظة الإسماعيلية

م	الاسم	رقم البرج	طراز البرج	اسم الخط	العنوان
١	مزرعة ربيع	٣٠	E30+5	الملاك	الإسماعيلية
٢	مجموعة الشمس للزراعات المتطورة	٤٥	E	الملاك	
٣	مجموعة الشمس للزراعات المتطورة	٤٦	E60+5	الملاك	
٤	مزرعة العسلى	٥٧	ET45	الجعفرية	
٥	مزرعة العسلى	٥٨	EPT45	الجعفرية	
٦	مزرعة العسلى	٥٩	ET45	الجعفرية	
٧	مزرعة السعودى	٦٩	E	الجعفرية	
٨	مزرعة السعودى	٧٠	E	الجعفرية	
٩	مزرعة السعودى	٧١	E	الجعفرية	
١٠	مزرعة السعودى	٧٢	E	الجعفرية	
١١	مزرعة السعودى	٧٣	E	الجعفرية	
١٢	مزرعة السعودى	٧٤	E	الجعفرية	
١٣	مزرعة السعودى	٧٥	E30	الجعفرية	

## بيان أرقام

### وطرازات الأبراج المطلوب تنفيذها بالقوة الجبرية

للخطين الكهربائيين (توليد الشباب / الملاك) ، (توليد الشباب / الجعفرية) جهد ٦٦ ك.ف

أولاً - الخط الكهربائي (توليد الشباب / الملاك) :

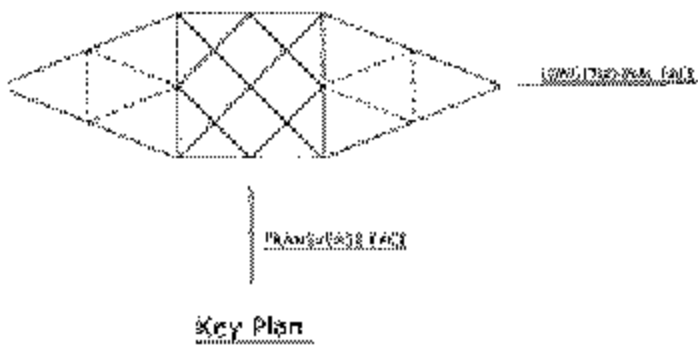
م	رقم البرج	طراز البرج
١	٣٠	E30+5
٢	٤٥	E
٣	٤٦	E60+5

ثانياً - الخط الكهربائي (توليد الشباب / الجعفرية) :

م	رقم البرج	طراز البرج
١	٥٧	ET45
٢	٥٨	EPT45
٣	٥٩	ET45
٤	٦٩	E
٥	٧٠	E
٦	٧١	E
٧	٧٢	E
٨	٧٣	E
٩	٧٤	E
١٠	٧٥	E30

TOWER DRAWINGS LIST		
DRAWING NUMBER	PAGES	DRAWING CONTENT
A-4075-00003-10-00	2	GENERAL LAYOUT & DRAWINGS FOR
A-4075-00003-10-01	1	STEEL & WOOD SETTING TEMPLATE
A-4075-00003-10-02	1	PLAN
A-4075-00003-10-03	1	GAGE PART
A-4075-00003-10-04	1	TOP COVER - W&W
A-4075-00003-10-05	1	WOOD CROSS-BARR
A-4075-00003-10-06	1	STEEL CROSS-BARR
A-4075-00003-10-07	2	BASIC BODY (PART-1)
A-4075-00003-10-08	1	BASIC BODY (PART-2)
A-4075-00003-10-09	1	COMMON DIMENSIONS (W&W & S&S)
A-4075-00003-10-10	1	FOR 3rd & 4th BODY EXTENSIONS
A-4075-00003-10-11	1	1st & 2nd BODY EXTENSION
A-4075-00003-10-12	1	4th & 5th BODY EXTENSION

TOWER WEIGHTS SCHEDULE					
TOWER	STEEL WT	STEEL SF	BOLTS	WASHERS, NUTS & PLATE WT	TOTAL (KG)
600 - TOWER	11,951.00	1,504.00	602.00	34.00	14,091.00
600-S TOWER	92,491.00	3,164.00	1,022.00	54.00	96,731.00
600-NS TOWER	11,954.00	5,202.00	606.00	34.00	18,800.00

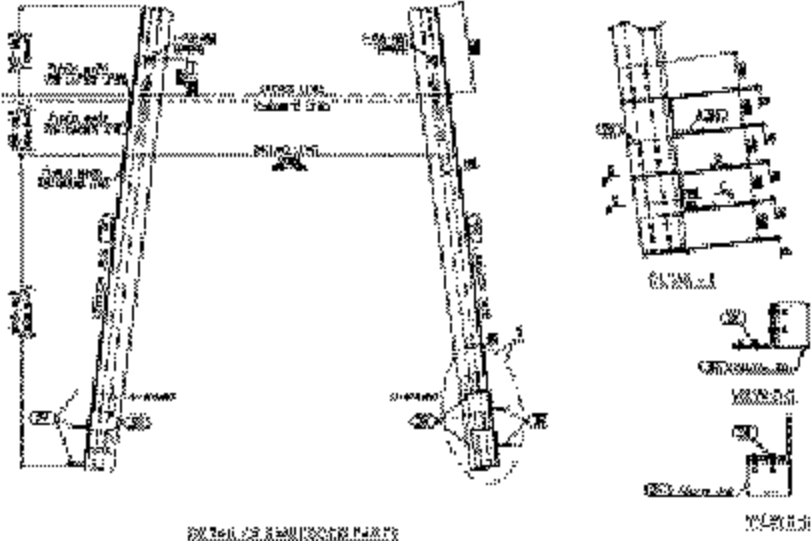


GENERAL NOTES :

- ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
- GENERAL:
  - MEMBERS MARKED WITH "W" LETTER ARE WOOD TEMPLATE STEEL, CONFORM TO S&S BY ACCORDING TO ESEN 10005.
  - MEMBER MARKED WITH "S" LETTERS ARE OF MILD STEEL, CONFORM TO ESEN BY ACCORDING TO ESEN 10005.
- STEEL & NUTS:
  - STEEL : 1 BOLT + 1 NUT + 1 PLAIN WASHER + 1 SPRING WASHER (W&W & S&S) AND 1/4" DIA.
  - BOLTS: ACCORDING TO DIN 934 GRADE 8.8 OR EQUIVALENT STANDARD AND SWEDENISH ACCORDING TO DIN 1990.
  - NUT : ACCORDING TO DIN 934.
  - PLAIN WASHER : ACCORDING TO DIN 1290.
  - SPRING WASHER : ACCORDING TO DIN 127.
- STEP BOLTS ACCORDING TO DIN 934 GRADE 8.8 AND DIN 1990 OR EQUIVALENT WITH UNFINISHED LENGTH = 2mm.
- STEP BOLT SET : 1 BOLT + 2 NUTS + 1 PLAIN WASHER + 1 SPRING WASHER.
- STEP BOLTS MUST BE REMOVABLE FROM THE UNIT CLAMPING DEVICE.
- DIMENSIONS NOT BE GALVANIZED AGED TO ASTM A153 (SEE SPEC/NOTES) BOLTS, NUTS & WASHERS NOT BE GALVANIZED AGED TO BE 72% (SEE SPEC/NOTES) EQUALLY.
- ALL MARK HAS TO BE PROVIDED WITH "320".
- ALL BLANK HOLES TO BE FILLED WITH BOLT END NUT.

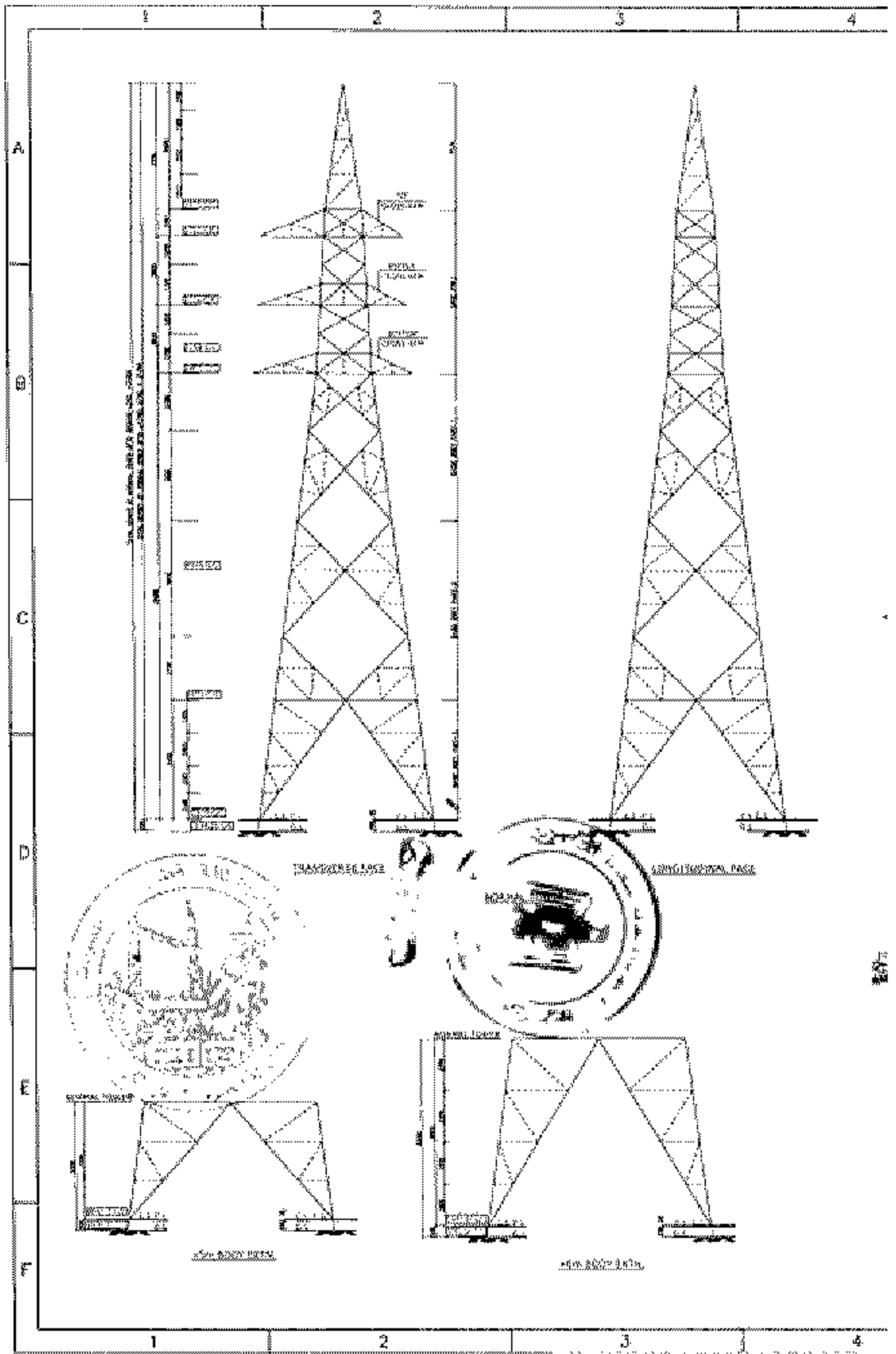
LEGEND :

- C/C = DIA. HOLE CENTER TO CENTER
- E/B = DIA. BACK TO BACK
- + = INDICATES 107.5mm HOLES FOR 100mm DIA BOLTS.
- ⊕ = INDICATES 107.5mm STEP HOLES FOR 100mm DIA STEP BOLTS.
- ⊙ = INDICATES TO BE USED AS STEP WASHER.
- ⊛ = INDICATES 102 mm HOLES FOR WASHER.
- = INDICATES PLATE PLATE.
- NS = NEAR SIDE
- NLS = NEAR SIDE
- F/S = FAR SIDE
- T = TRANSVERSE FACE
- L/F = LONGITUDINAL FACE
- NT = NORMAL TOWER
- BT = BODY EXTENSION
- ACT = DIMENSIONS ALONG VERTICAL
- F = FACE VALUE "DIMENSIONS ALONG SLOPE"



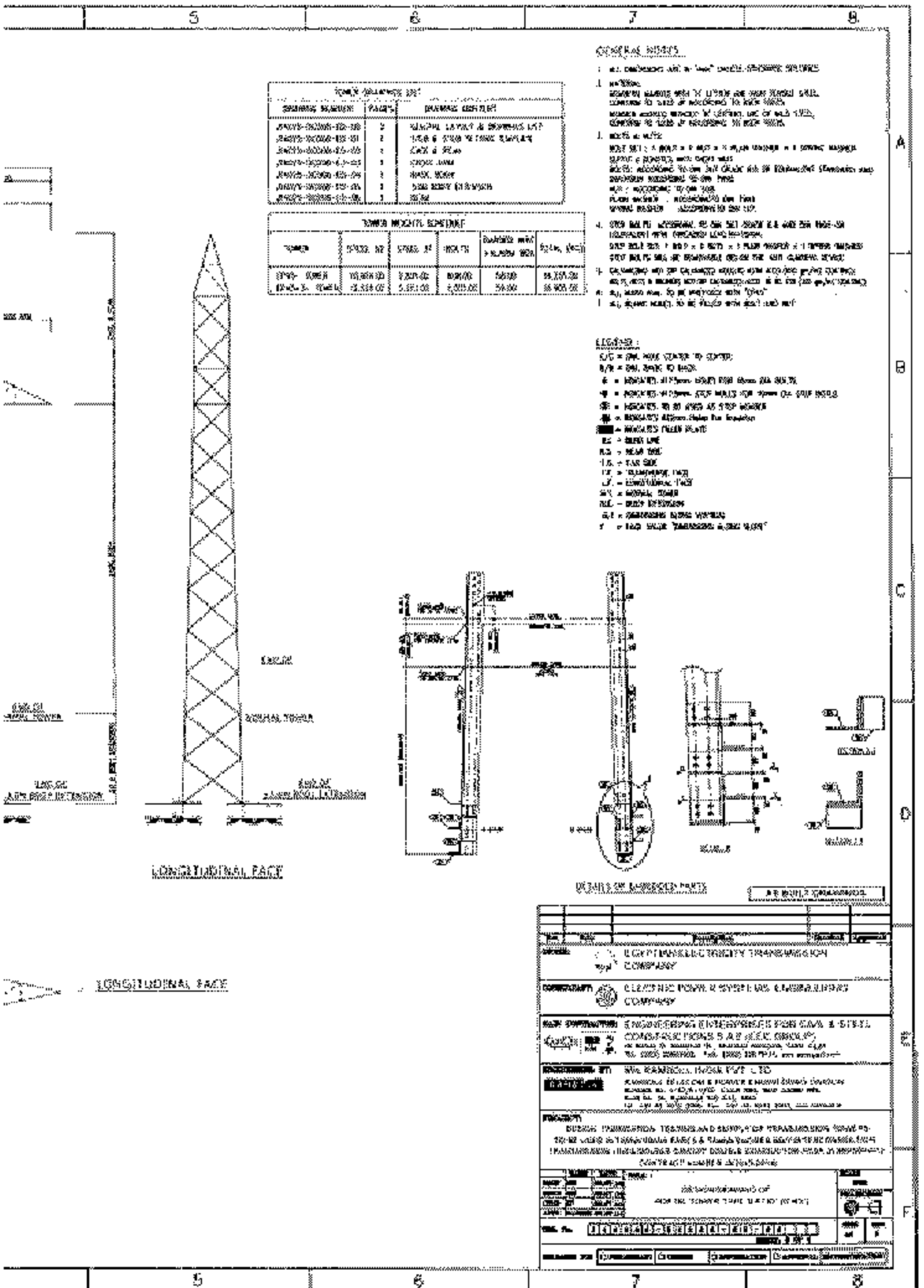
AS BUILT DRAWINGS

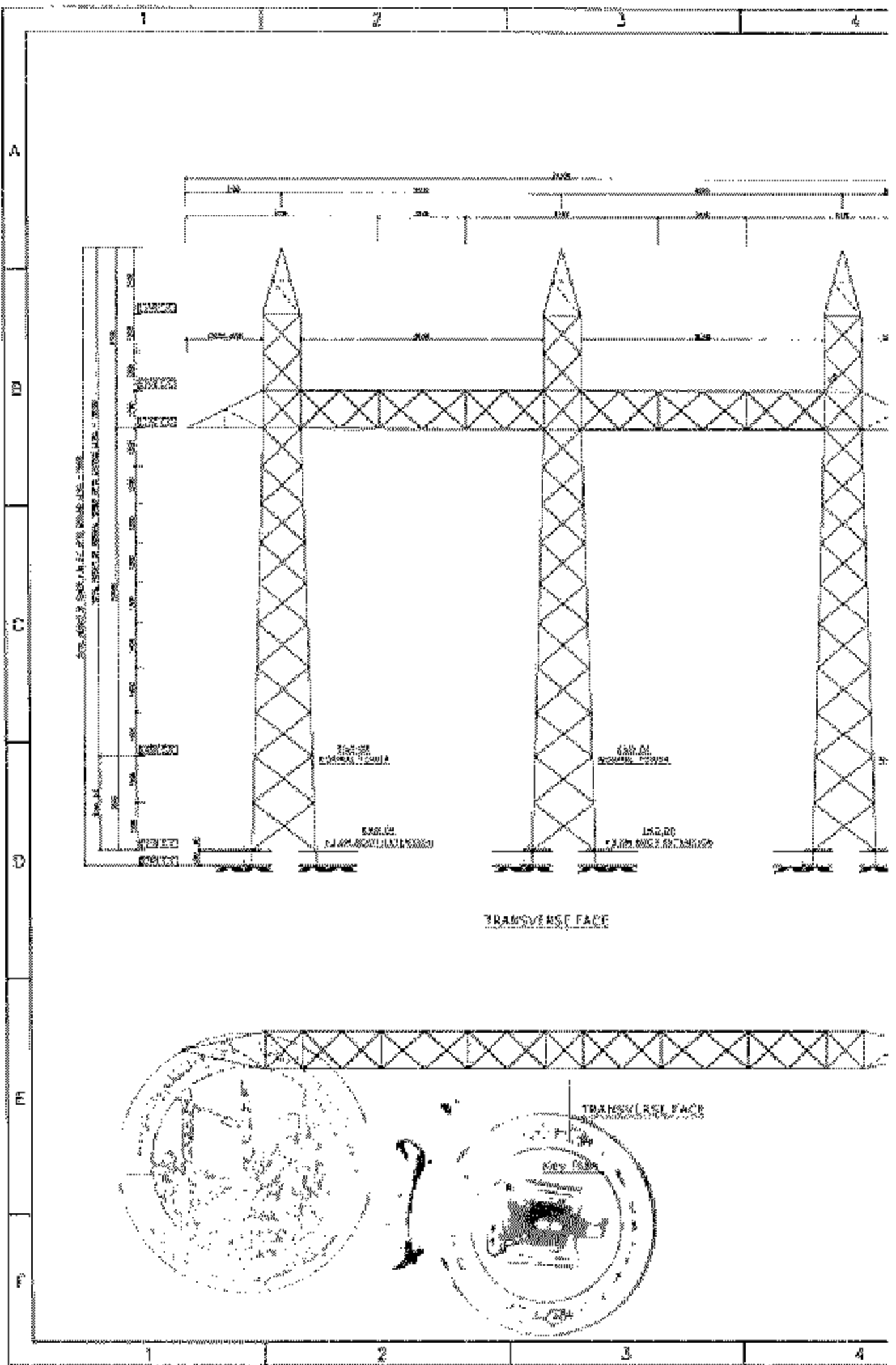
<p>ENTREPRENEUR: ELECTRIC POWER SYSTEMS ENGINEERING COMPANY</p>			
<p>CLIENT: ELECTRIC POWER SYSTEMS ENGINEERING COMPANY</p>			
<p>DESIGN CONTRACTOR: ELECTRIC POWER SYSTEMS ENGINEERING COMPANY &amp; STEEL CONSTRUCTION S.A.L. (IN CONJUNCTION)</p>			
<p>CONTRACT NO: 600-NS-TOWER-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</p>			
<p>PROJECT: 600-NS-TOWER-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</p>			
<p>DATE: 19/11/2020</p>			
<p>SCALE: 1:100</p>			
<p>PROJECT NO: 600-NS-TOWER-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</p>			
<p>DATE: 19/11/2020</p>			
<p>SCALE: 1:100</p>			
<p>PROJECT NO: 600-NS-TOWER-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</p>			
<p>DATE: 19/11/2020</p>			
<p>SCALE: 1:100</p>			



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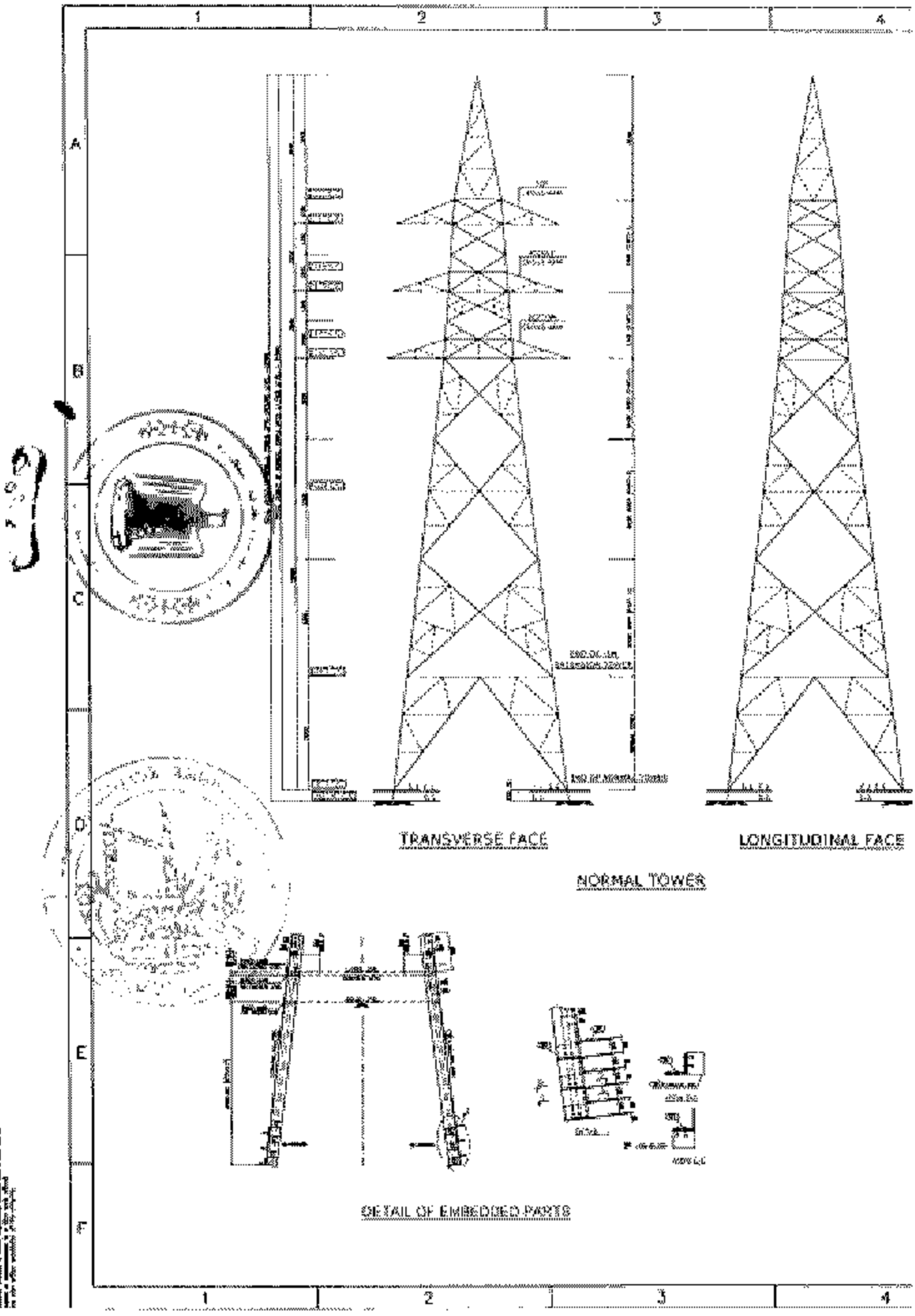




الوقائع المصرية - العدد ٢٦١ (تابع) في ١٩ نوفمبر سنة ٢٠٢٠



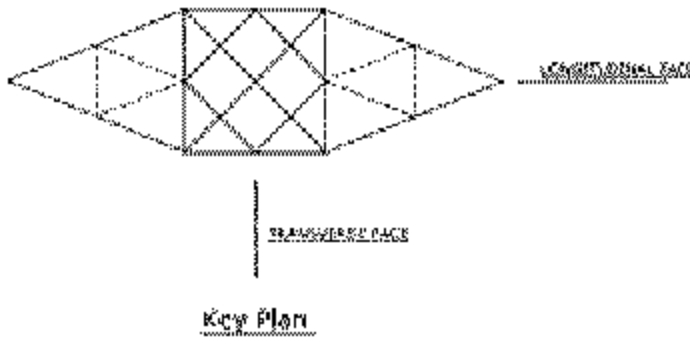




مرسوم رقم ١٠٠٠ لسنة ٢٠٢٠  
 مرسوم رقم ١٠٠٠ لسنة ٢٠٢٠  
 مرسوم رقم ١٠٠٠ لسنة ٢٠٢٠

TOWER DIMENSIONS LIST		
DRAWING NUMBER	PAGES	DRAWING CONTENT
A 4825-02002-10-00	1	GENERAL LAYOUT & DIMENSIONS LIST
A 4825-02002-10-01	1	STEP & STEP SETTING TEMPLATE
A 4825-02002-10-02	1	CAGE (PART-1) & PLATE
A 4825-02002-10-03	1	CAGE (PART-2)
A 4825-02002-10-04	1	TOP CROSS-ARM
A 4825-02002-10-05	1	WINDLE CROSS-ARM
A 4825-02002-10-06	1	BOTTOM CROSS-ARM
A 4825-02002-10-07	1	BASE BODY (PART-1)
A 4825-02002-10-08	1	BASE BODY (PART-2)
A 4825-02002-10-09	1	BASE BODY (PART-3)
A 4825-02002-10-10	1	COMMON DIMENSIONS (VIEW 01-09) FOR 10, 11 & 12 W BODY DIMENSIONS
A 4825-02002-10-11	1	5 W BODY DIMENSION (COMMON FOR 10 W BODY DIMENSION)
A 4825-02002-10-12	1	8 W BODY DIMENSION
A 4825-02002-10-13	1	11 W BODY DIMENSION (BOTTOM PART)

TOWER WEIGHTS SCHEDULE					
TOWER	STEEL WT	WIND. WT	BOLTS	WASHER W/PC # ALUMINUM BOLTS	TOTAL (KG)
10-TOWER	3,918.00	3,496.00	405.00	19.00	7,938.00
11-TOWER	4,884.00	4,452.00	530.00	32.00	9,908.00
12-TOWER	4,642.00	4,305.00	610.00	31.00	9,690.00
14-TOWER	5,814.00	5,378.00	670.00	38.00	11,900.00

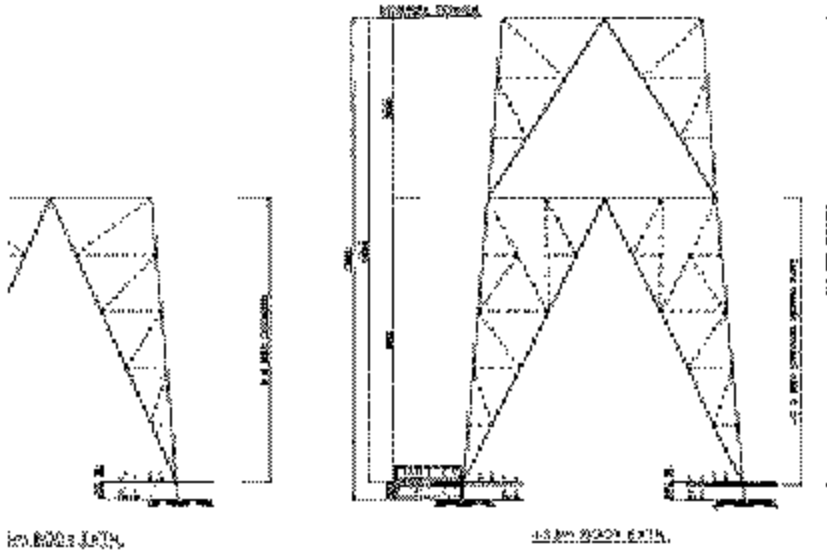


GENERAL NOTES :

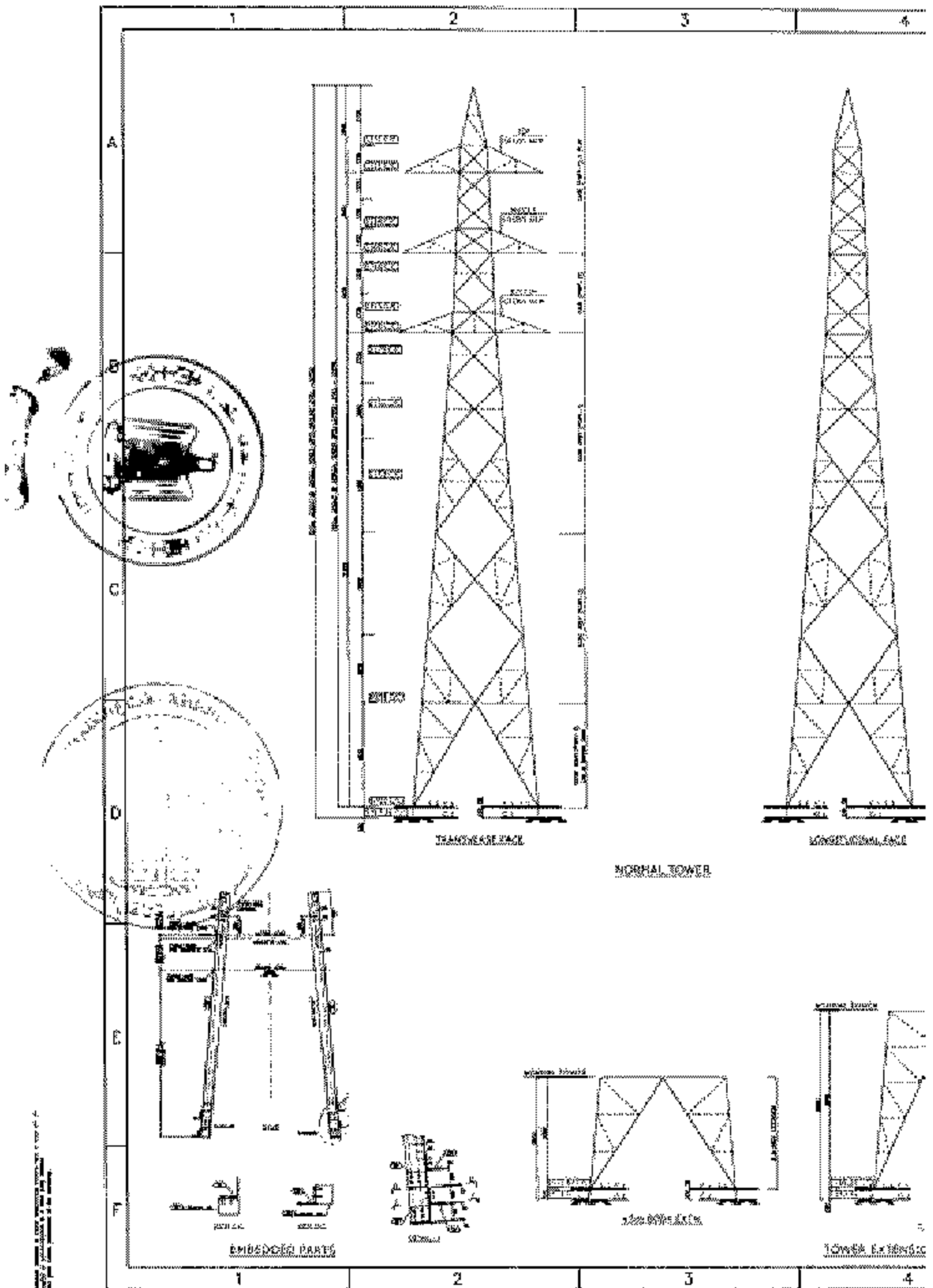
- ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED
- MATERIAL:  
MEMBERS MARKED WITH "H" LETTER ARE HIGH TENSILE STEEL.  
COMMON TO STEEL ARE ACCORDING TO ESEN 1002  
MEMBER MARKED WITH "M" LETTERS ARE OF MILD STEEL.  
COMMON TO STEEL ARE ACCORDING TO ESEN 1002
- BOLTS & NUTS  
BOLT SET : 1 BOLT + 1 NUT + 1 PLAIN WASHER + 1 SPRING WASHER  
BOLT : DOMESTIC AND SHEFF MET  
BOLTS ACCORDING TO EN 207 GRADE 8.8 OR EQUIVALENT STANDARD AND  
DIMENSION ACCORDING TO EN 7992  
NUT : ACCORDING TO EN 7992  
PLAIN WASHER : ACCORDING TO EN 7992  
SPRING WASHER : ACCORDING TO EN 107
- STEP BOLT ACCORDING TO EN 207 GRADE 8.8 AND EN 7992 OR  
EQUIVALENT WITH TYPICAL DIMENSIONS  
STEP BOLT SET : 1 BOLT + 2 NUTS + 1 PLAIN WASHER + 1 SPRING WASHER  
STEP BOLTS WILL BE REMOVABLE BELOW THE ANTI COLLISION DEVICE
- GALVANIZING: HOT DIP GALVANIZED ACCORDING TO ASTM A153 (600 g/m<sup>2</sup> COATING)  
BOLTS, NUTS & WASHERS NOT DIP GALVANIZED ACCORDING TO BS 729 (305 g/m<sup>2</sup> COATING)
- ALL WELDING TO BE PROTECTED WITH ZC
- ALL BLANK HOLES TO BE FILLED WITH BOLT AND NUT

LEGEND :

- C/C = DIM. HOLE CENTER TO CENTER
- E/B = DIM. BACK TO BACK
- ⊕ = INDICATES 87.5mm HOLES FOR 10mm DIA BOLTS
- ⊙ = INDICATES 87.5mm STEP HOLES FOR 10mm DIA STEP BOLTS
- ⊖ = INDICATES TO BE USED AS STEP MEMBER
- ⊗ = INDICATES 87.5mm HOLES FOR INSULATOR
- = INDICATES FILLER PLATE
- B1 = BEND ONE
- N.S. = NEAR SEE
- F.S. = FULL SIZE
- T.T. = TRANSVERSE FACE
- L.F. = LONGITUDINAL FACE
- N.E. = NORMAL VIEW
- B.E. = BODY EXTENSION
- AL = DIMENSIONS ALONG VERTICAL
- S = FACE WHERE "DIMENSIONS ALONG SLOPE"



جمهورية مصر العربية وزارة التخطيط الاقتصادية والاجتماعية والتعاون الدولي الشركة العامة للتصميم والدراسات الهندسية	
PROJECT: 11-TOWER DRAWING NO: A 4825-02002-10-00	
SHEET NO: 1 OF 1	
DATE: 10/11/2020	
SCALE: 1:100	
DRAWN BY: [Signature] CHECKED BY: [Signature]	
PROJECTED BY: [Signature]	
APPROVED BY: [Signature]	



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**GENERAL NOTES :**

- 1. ALL DIMENSIONS ARE IN "mm." UNLESS OTHERWISE SPECIFIED.
- 2. MATERIAL:  
MEMBERS MARKED WITH "W" LETTER ARE HIGH TENSILE STEEL, CONFORM TO S355 JR ACCORDING TO EN8082.  
MEMBER MARKED WITHOUT "W" LETTERS ARE OF MILD STEEL, CONFORM TO S235 JR ACCORDING TO EN10025.
- 3. BOLTS & NUTS:  
BOLT SET: 1 BOLT + 1 NUT + 1 FLAT WASHER + 1 SPRING WASHER  
BOLTS & NUTS SHALL BE AS PER THE NUT  
BOLTS ACCORDING TO EN ISO 898-1 OR EN ISO 10990 STANDARD AND  
DIMENSION ACCORDING TO EN ISO 1204  
NUT - ACCORDING TO EN ISO 1058.  
FLAT WASHER - ACCORDING TO EN ISO 1234.  
SPRING WASHER - ACCORDING TO EN ISO 1701.
- 4. STEP BOLTS ACCORDING TO EN ISO 898-1 & EN ISO 10990 OR EQUIVALENT WITH INDICATED LENGTHS SHALL BE:  
STEP BOLT SET: 2 BOLT + 2 NUTS + 1 FLAT WASHER + 1 SPRING WASHER  
STEP BOLTS SHALL BE REMOVED BEFORE THE JACKETING MOVES.
- 5. DIMENSIONS NOT INDICATED SHALL BE AS PER EN 1090 PART 1 & 2 FOR ALL DIMENSIONS.
- 6. ALL WELD JOINTS TO BE PROTECTED WITH ZINC.
- 7. ALL BLANK HOLES TO BE FILLED WITH BOLT AND NUT.

**LEGEND :**

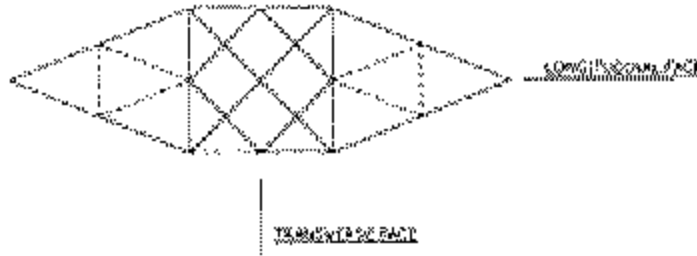
- C/C = DIA. HOLE CENTER TO CENTER
- W/B = DIA. FLANGE TO FLANGE
- \* = INDICATES 45° SLANT HOLES FOR MOUNTING ON BOLT
- ① = INDICATES 45° SLANT HOLES FOR MOUNTING ON STEP BOLTS
- = INDICATES TO BE USED AS STEP MEMBER
- = INDICATES HOLES FOR MOUNTING ON BOLT
- = INDICATES TOWER PLATE
- EL = END LINE
- M.S. = MAIN SIZE
- F.S. = FACE SIZE
- T.F. = TRANSVERSE FACE
- L.F. = LONGITUDINAL FACE
- H.T. = NORMAL DIMENSION
- B.E. = BODY EXTENSION
- A.L.T. = DIMENSIONS ALONG VERTICAL
- F = FACE VALUE DIMENSIONS ALONG SLOPE

**TOWER DRAWINGS LIST**

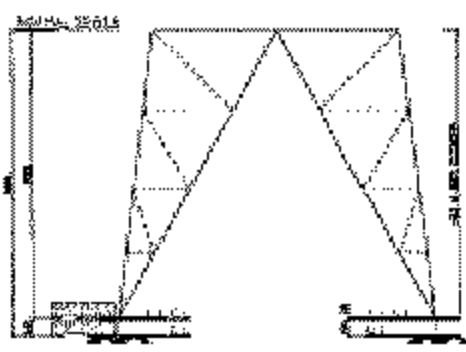
DRAWING NUMBER	PAGES	DRAWING CONTENT
B4025-BC003-01-01	2	GENERAL LAYOUT & DRAWINGS LIST
B4025-BC003-01-02	1	STEP & STEP SECTION TEMPLATE
B4025-BC003-01-03	1	PLATE
B4025-BC003-01-04	1	GRID PART
B4025-BC003-01-05	1	TOP CROSS - VIEW
B4025-BC003-01-06	1	MIDLINE CROSS - VIEW
B4025-BC003-01-07	1	BOTTOM CROSS - VIEW
B4025-BC003-01-08	2	BASIC BODY (PART-1)
B4025-BC003-01-09	1	BASIC BODY (PART-2)
B4025-BC003-01-10	1	BASIC BODY (PART-3)
B4025-BC003-01-11	1	TOWER DIMENSIONS (VIEW 21-27)
B4025-BC003-01-12	2	E.S. & BODY EXTENSION
B4025-BC003-01-13	1	E.S. & BODY EXTENSION

**TOWER WEIGHTS SCHEDULE**

TOWER	SAFETY	S.I.E.T. W.P.	BOLTS	BARBED WIRE	TOTAL (KG)
L.10 - TOWER	5,899.00	4,010.00	582.00	25.00	10,416.00
L.15 - TOWER	8,188.00	5,132.00	570.00	25.00	13,915.00
L.20 - TOWER	12,527.00	8,289.00	587.00	25.00	21,448.00

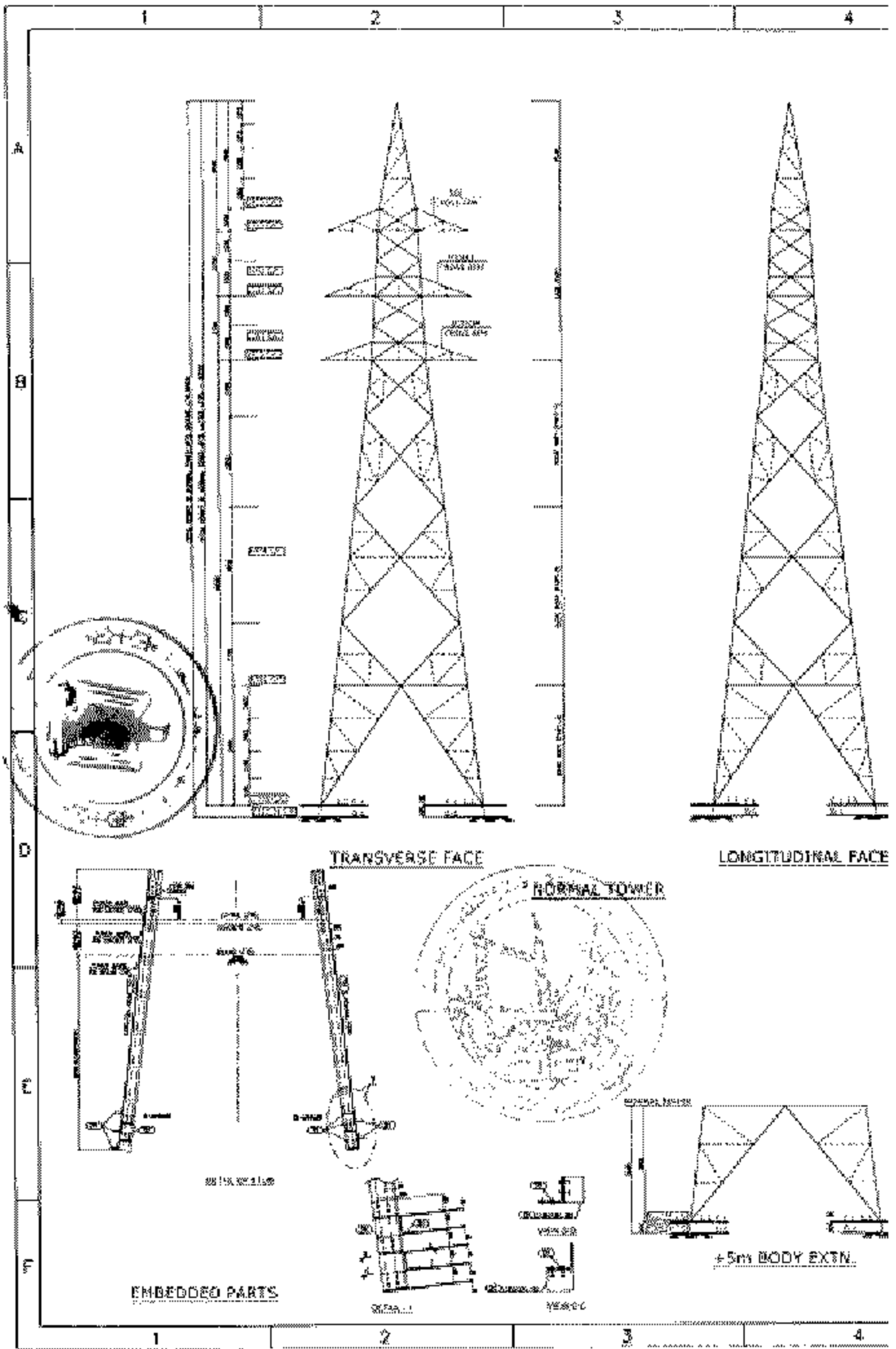


Key Plan



TOWER EXTENSIONS

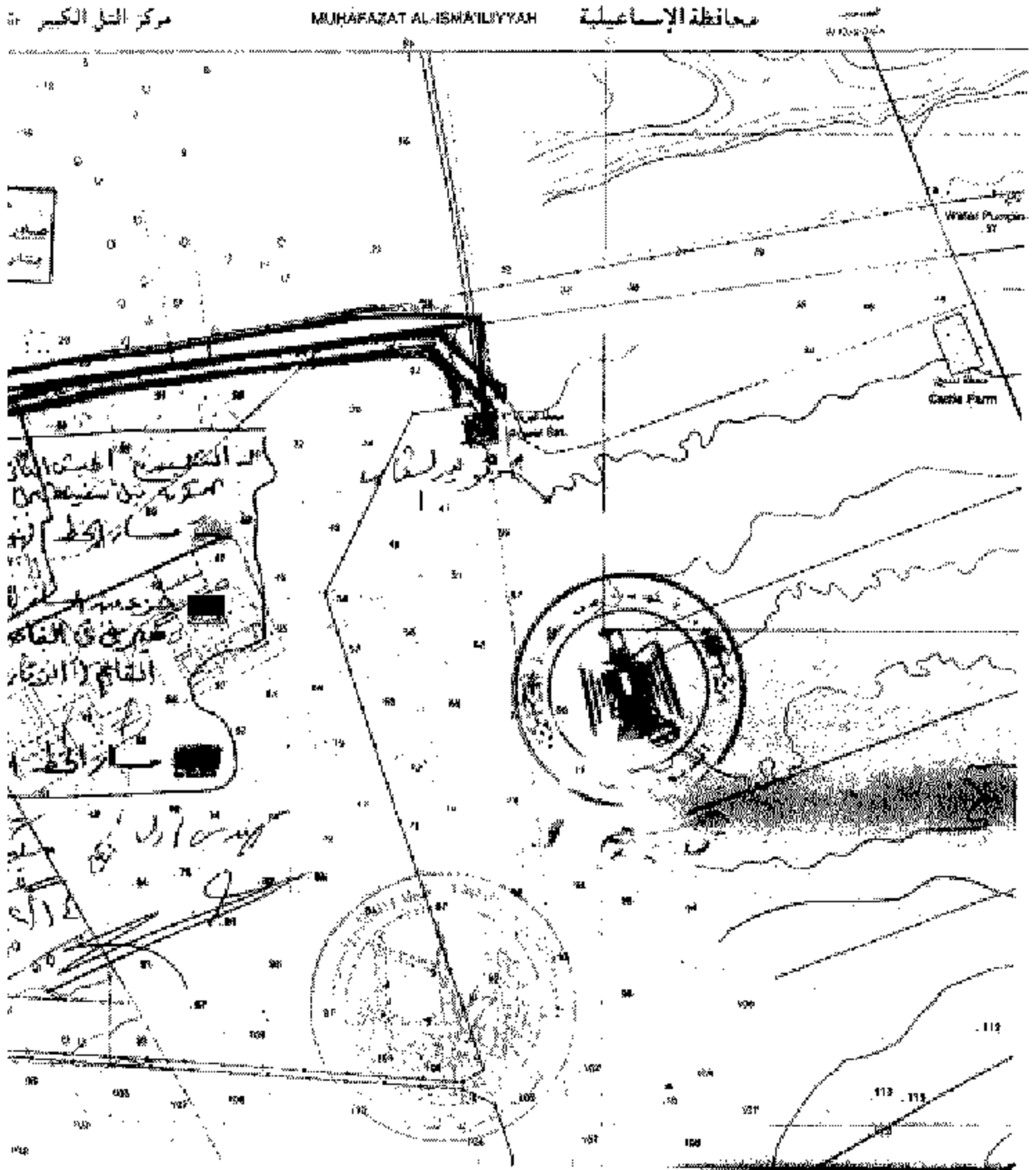
Project Name	ESTIMATES ELECTRICITY TRANSMISSION
Client	EGYPTIAN POWER SYSTEMS ENGINEERING COMPANY
Project Description	ELECTRIC POWER SYSTEMS ENGINEERING COMPANY
Project Location	EGYPTIAN POWER SYSTEMS ENGINEERING COMPANY
Project No.	11/2020/175
Project Date	11/2020/175
Project Status	PROGRESSING
Project Manager	Dr. Mohamed El-Nasr
Project Engineer	Dr. Mohamed El-Nasr
Project Designer	Dr. Mohamed El-Nasr
Project Checker	Dr. Mohamed El-Nasr
Project Approver	Dr. Mohamed El-Nasr



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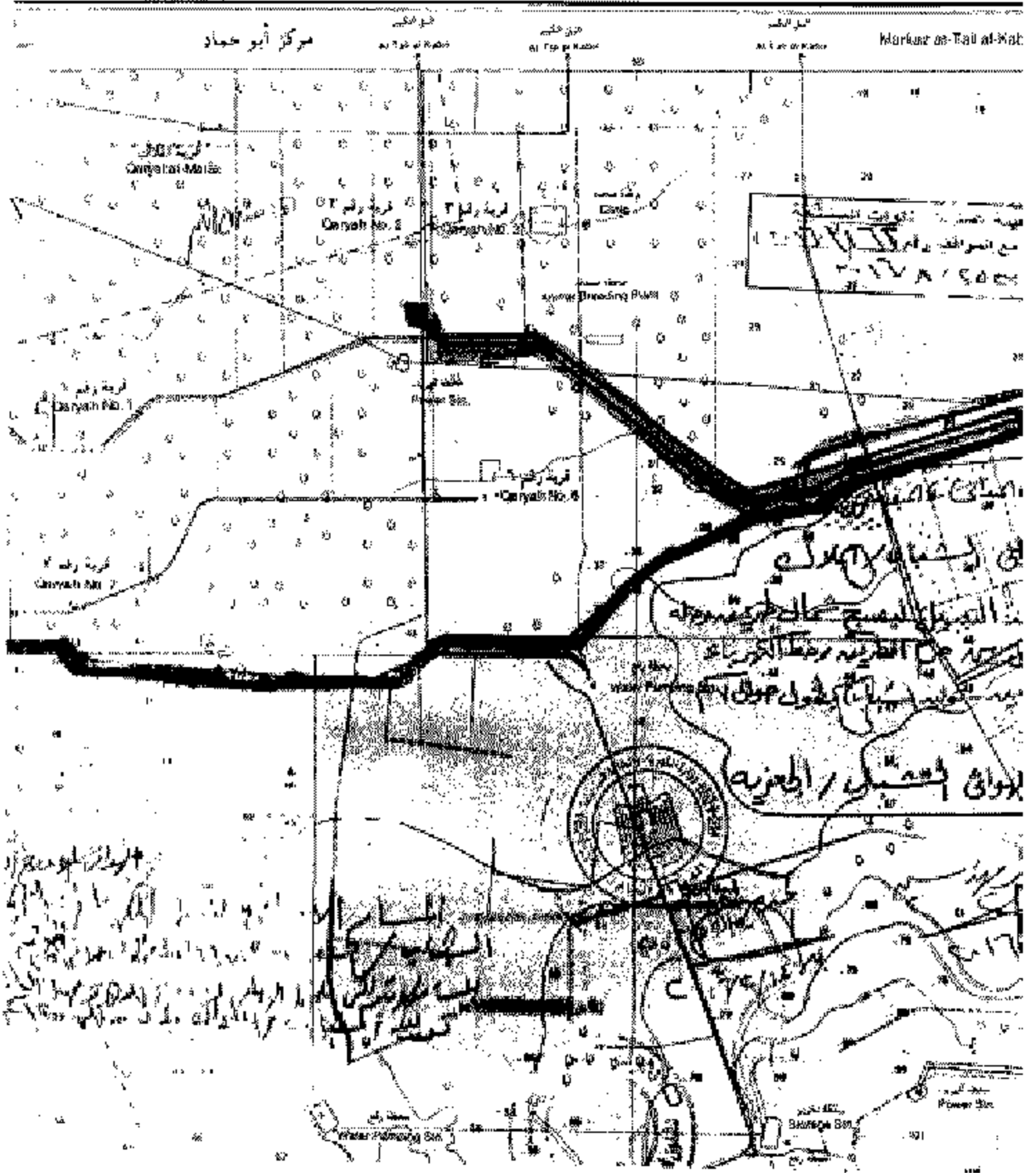
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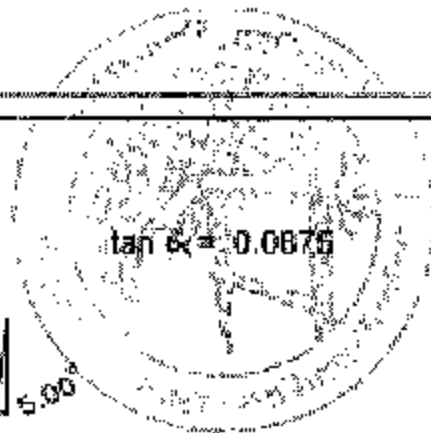


# كران WADI

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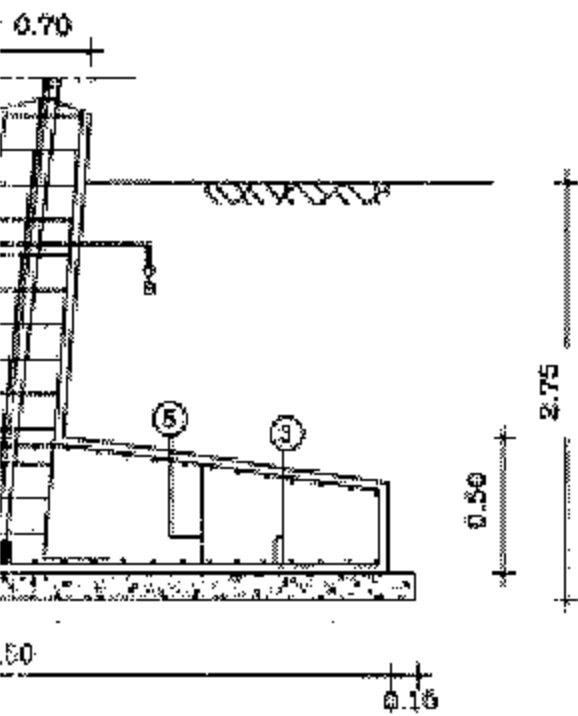






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**NOTES:**

- 1- Foundations are designed for the following soil conditions:  
 Allowable bearing capacity = 55.00 kN/m<sup>2</sup>  
 Angle of friction of soil = 5.0 degree  
 Unit Weight of soil = 1.20 kN/m<sup>3</sup>  
 Angle of internal friction = 20 degree  
 No Ground Water table.
- 2- Reinforcement bars (if required) should be high tensile steel (HR52) of min. yield strength 23500. Kg/cm<sup>2</sup>.
- 3- Cement to be used should be sulphate resisting Cement.
- 4- Concrete mix should be designed to provide the required cube strength with min. amount:  
 350 Kg/m<sup>3</sup> of cement for reinforced concrete.  
 250 Kg/m<sup>3</sup> of cement for plain concrete.
- 5- Min. cube strength (28 days) for Foundation Concrete = 250 Kg/cm<sup>2</sup>
- 6- Placing of concrete should be made without interruption.
- 7- Min. concrete cover of reinforcement bars should be 5 cm.
- 8- Curing must be done for the first 3 days after concrete placing.
- 9- The time period between placing concrete and erection the upper structure should not be less than 7 days.
- 10- The A. C. surfaces in contact with soil should be finished by layers of cold bitumen.
- 11- Back filling should be from local soil compacted in layers and each layer thickness should not exceed 30 cm and the degree of compaction of each layer should not be less than 95% of the max. dry density determined from standard proctor test.
- 12- All dimensions must be checked against the steel tower erection drawings.
- 13- Piles, (Dimensions and replacement) layers have square precast dimensions.

**E - CLASS 3**


ID	Length (mm)	Number (Bar)	Total Length (mm)	Weight (Kg)
18	3.70	12	44.40	28.85
19	3.80	58	220.40	144.26
12	3.80	58	220.40	144.71
10	3.80	15	57	53.67
12	1.25	18	22.50	30.33
Total Weight				365.79

و ك 2263 ج  
 على المقاول المنفذ مراجع

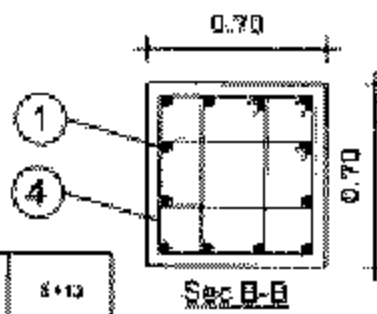
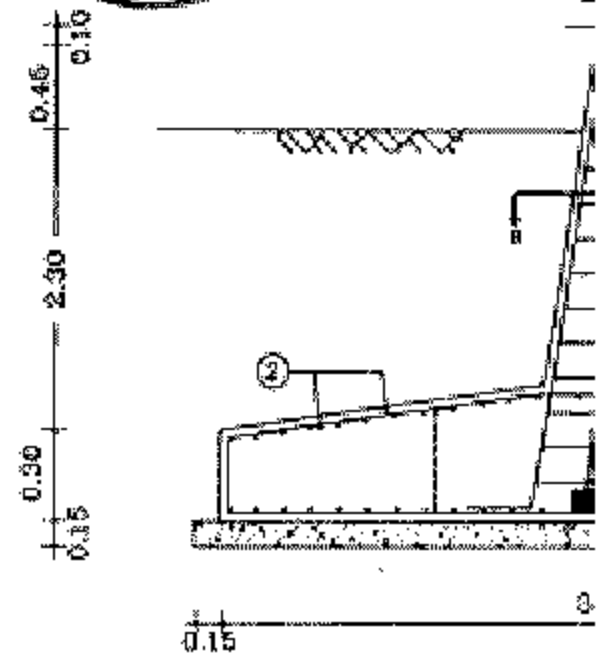
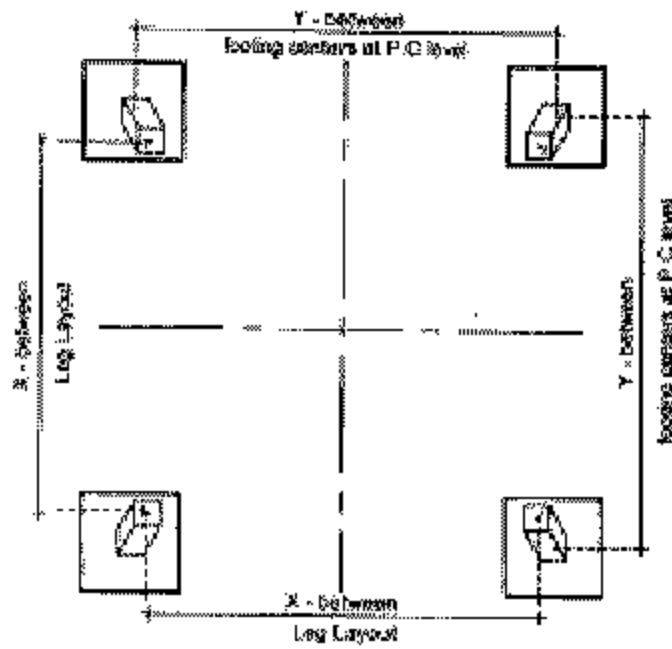
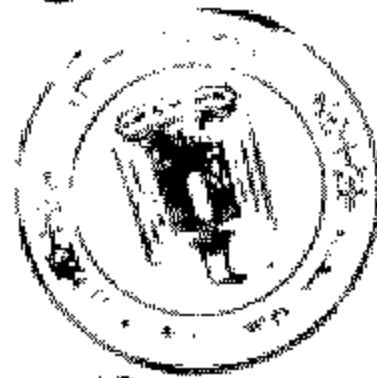
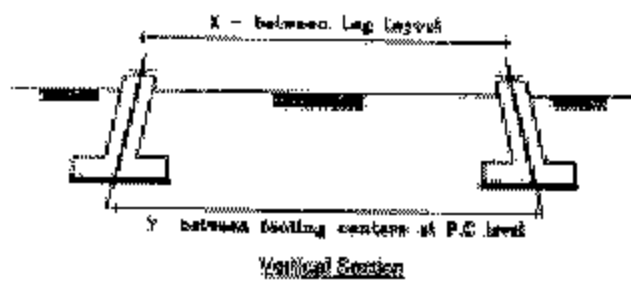
ARAB REPUBLIC OF EGYPT  
 MINISTRY OF ELECTRICITY AND ENERGY  
 EGYPTIAN ELECTRICITY TRANSMISSION COMPANY E.E.T.C  
 ELSHARAH GENERATION / ELBAHIG ELBAHIG E.G.

DESIGNED BY  
**SGRC**  
 STRUCTURAL & GEOTECHNICAL RESEARCH CENTER  
 P.O. BOX 11300 EL HELWAN  
 EL HELWAN - EGYPT  
 TEL: 02-3523111 FAX: 02-3523112

**PROJECT:** تولى تنفيذ التأسيسات لبرج الجهد 66 ك.ف.ج

**TOWER TYPE:** R - CLASS 3

GROUP NAME	DATE
DESIGN	2017
CHECKED	2017
APPROVED	2017

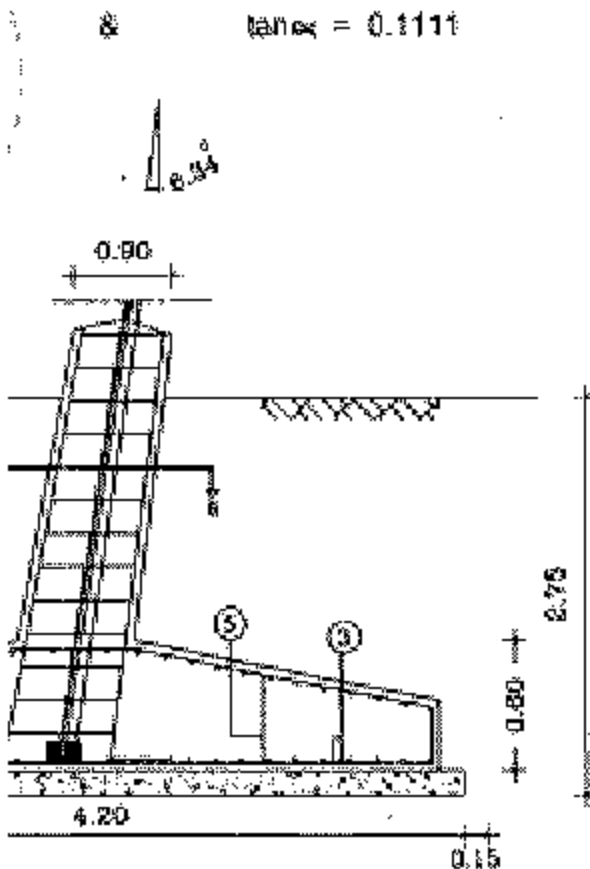



Tower Dimension	E	E-5	E-8	E-13
X dim. (mm)	5768	5846	7172	8080
Y dim. (mm)	6096	7172	7009	6576

QUANTITIES PER TOWER					
P.C Vol (m <sup>3</sup> )	R.C Vol (m <sup>3</sup> )	Steel Weight (Kg)	Excav Vol (m <sup>3</sup> )	Foundation Area (m <sup>2</sup> )	Reinforcement Vol (m <sup>3</sup> )
8.2	23.70	2800	128.04	148	0.00

REINFORCEMENT DE LAIS PER FOOTING		
Bar ID	Bar Shape	Bar
1		10
3		10
2		10
4		10
5		10

ملاحظة: طول العدايق وكذلك المسافة بين سمار البنتونة قبل البدء باعمال التنفيذ



$\alpha = 0.1111$

**NOTES:**

- 1- Foundation are designed for the following soil conditions:  
 Allowable net bearing capacity = 38 Kgf/cm<sup>2</sup>  
 Angle of friction of soil = 30-degree  
 Unit Weight of soil = 1.70 tons  
 Angle of conical heelcut = 30-degree  
 No Ground Water Table.
- 2- Reinforcement bars to be used should be High tensile steel (S635) of min. yield strength 3600 Kgf/cm<sup>2</sup>.
- 3- Cement to be used should be 42.5 grade Besting Cement.
- 4- Concrete mix should be designed to provide the required cube strength with min amount 300 Kgf/cm<sup>3</sup> of cement for reinforced concrete.  
 300 Kgf/cm<sup>3</sup> of cement for plain concrete.
- 5- Min. cube strength (28 days) for Foundation Concrete = 250 Kgf/cm<sup>2</sup>.
- 6- Placing of concrete should be made without interruption.
- 7- Min. concrete cover of reinforcement bars should be 8-cm.
- 8- Curing must be done for the first 3 days after concrete placing.
- 9- The free placed between placing concrete and section the superstructure should not be less than 7 days.
- 10- The R. C. surface in contact with soil should be covered by 3 layers of cold bitumen.
- 11- Back filling should be from local soil compacted in layers and each layer thickness should not exceed 20 cm and the degree of compaction of each layer should not be less than 95% of the max. dry density determined from standard proctor test.
- 12- All dimensions must be checked against the steel power engineering drawings.
- 13- Pits, Channels and replacement layers have equal projected dimensions.

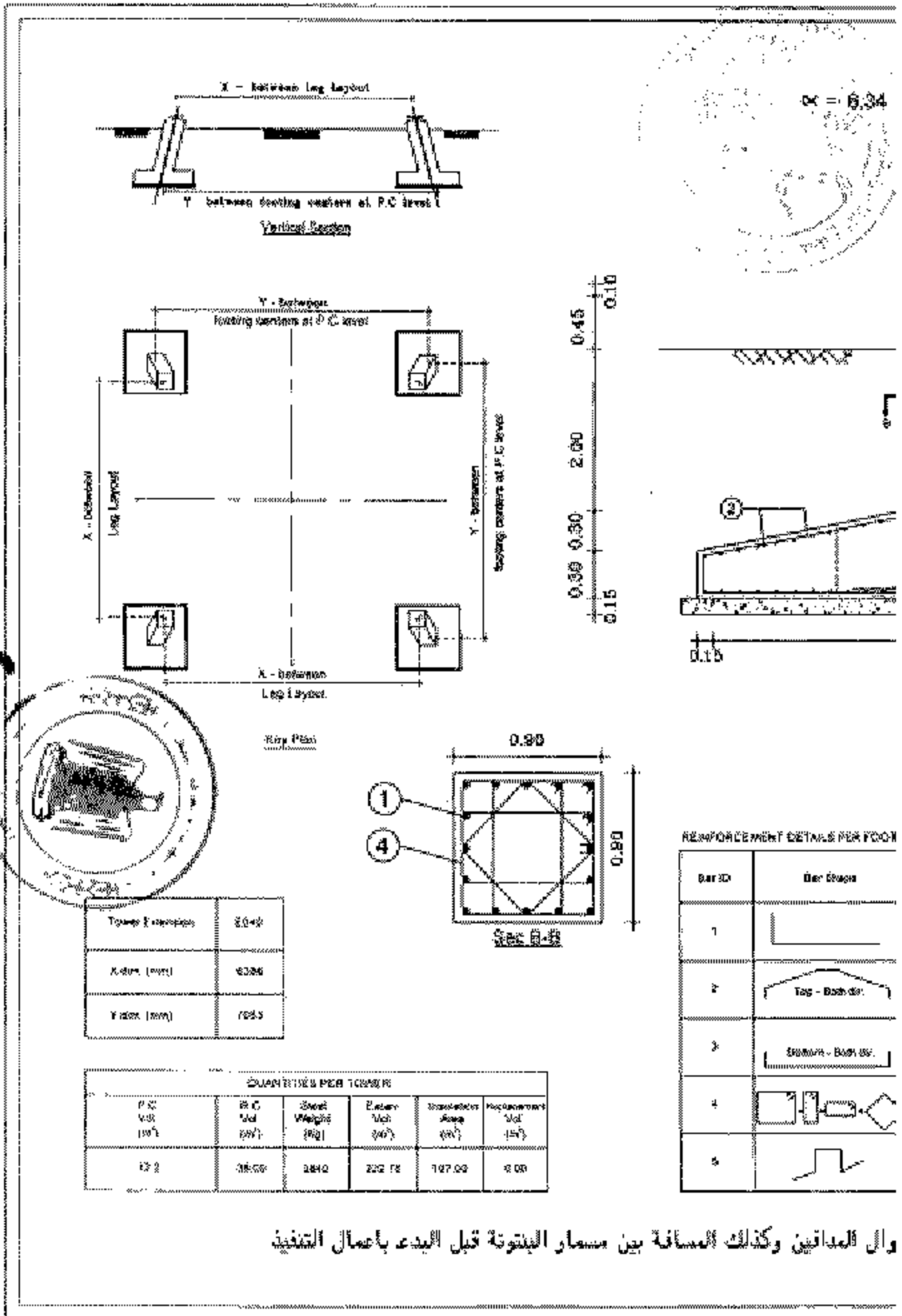
**E0 - CLASS 3**

MSD

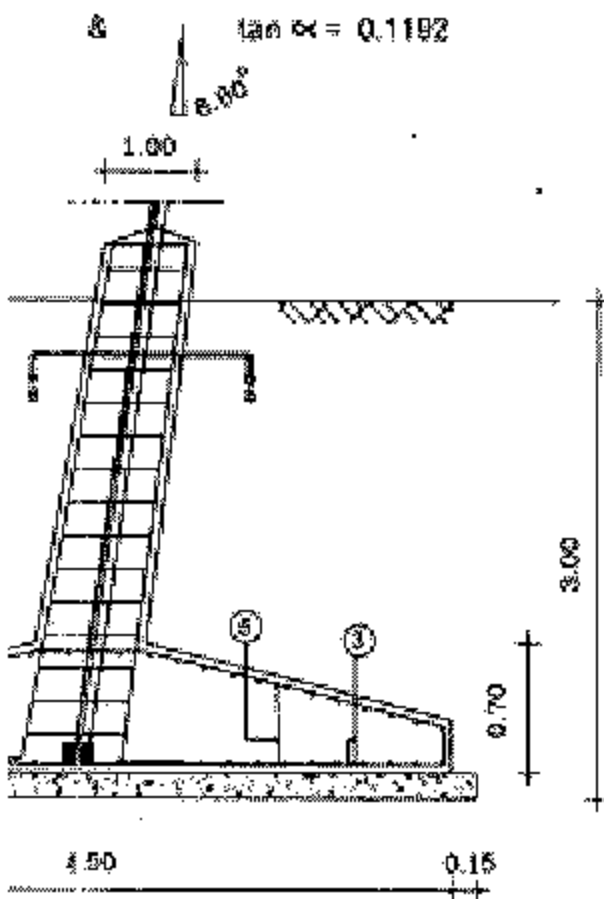
Ø (mm)	Length (m)	Number (bars)	Total Length (m)	Weight (Kg)
22	3.70	16	39.20	178.65
12	4.65	80	364.00	323.48
12	4.80	80	360	316.80
10	97.00	16	155.2	112.54
12	1.20	28	33.60	27.74
				<b>300</b>

على المعاول المنفذ مراجعة الط

ARAB REPUBLIC OF EGYPT MINISTRY OF ELECTRICITY AND ENERGY EGYPTIAN ELECTRICITY TRANSMISSION COMPANY E.E.T.C. ELDOKKI GENERATION / AIN HELWAN				
<b>SGRC</b> STRUCTURE & GEOTECHNICAL RESEARCH CENTER 4590 HELWAN Tel: (+202) 246547 - 246554				
PROJECT: <b>توليد الكهرباء / الجوف ريسة جوهسد 66 ك.ف</b>				
DESIGN TYPE: <b>E0 - CLASS 3</b>				
DESIGNER		DESIGN NAME		DATE
CHECKED		CHECKED NAME		DATE
APPROVED		APPROVED NAME		DATE
REVISION NO.		REV.	BY	DATE
DRAWING NO.		REV.	BY	DATE



والمدافين وكذلك المسافة بين مسمار البتونة قبل البدء بأعمال التنفيذ



**NOTES:**

- 1- Foundation are designed for the following soil conditions:  
 Allowable net bearing capacity = 15.00 MPa  
 Angle of friction of soil = 30 degree  
 Unit Weight of soil = 1.70 (t/m<sup>3</sup>)  
 Angle of internal friction = 30 degree  
 No Ground Water table
- 2- Reinforcement bars to be used should be high tensile steel (SAB) of iron, yield strength 3600 Kg/cm<sup>2</sup>.
- 3- Cement to be used should be (Sulphate Resisting Cement)
- 4- Concrete mix should be designed to provide the required cube strength with min. amount 320 Kg/m<sup>3</sup> of cement for reinforced concrete.  
 280 Kg/m<sup>3</sup> of cement for plain concrete.
- 5- Min. cube strength (28 days) for Foundation Concrete = 250 Kg/cm<sup>2</sup>
- 6- Placing of concrete should be made without interruption.
- 7- Min. concrete cover of reinforcement bars should be 40 mm.
- 8- Curing must be done for the first 7 days after concrete placing.
- 9- The time period between placing concrete and erected the upper structure should not be less than 7 days.
- 10- The R. C. surfaces in contact with soil should be insulated by 2 layers of cold bitumen.
- 11- Back filling should be done with soil compacted in layers and each layer thickness should be 300 mm and the degree of compaction of each layer should not be less than 95% of the M.C.C. dry density determined from standard proctor test.
- 12- All dimensions must be checked against the most lower working drawings.
- 13- Poles, Chimneys and replacement types have approved standard dimensions.

**E30 - CLASS 3**

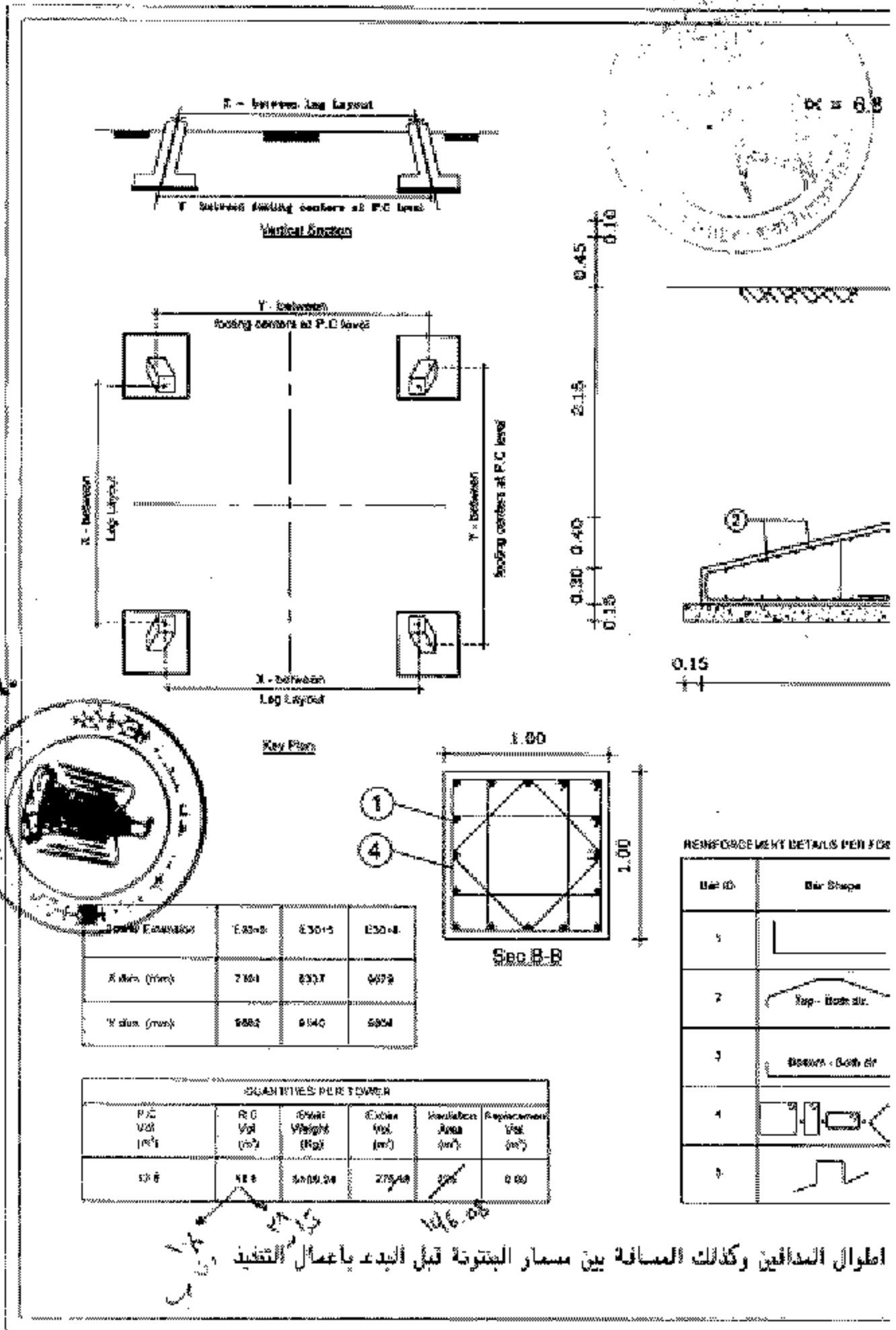
LISTING:

Sl. No.	Length (m)	Number (Bar)	Total Length (m)	Weight (kg)
1	2.25	16	36.00	180.00
2	4.00	60	240.00	1200.00
3	4.00	60	240.00	1200.00
4	12.70	20	254.00	1270.00
5	1.30	20	16.40	82.00

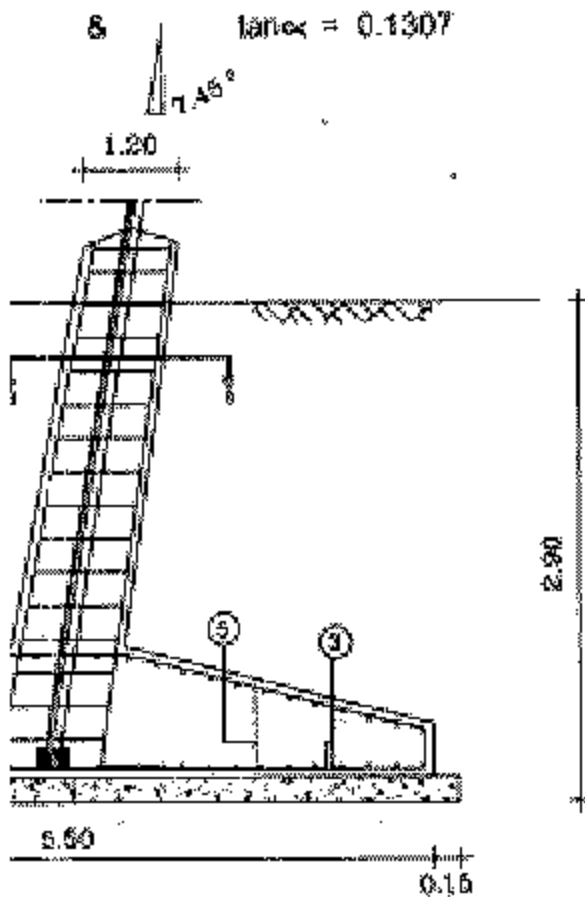
على المتاول التنفيذ مراجعة

12/11/2020

<p>ARAB REPUBLIC OF EGYPT                  MINISTRY OF ELECTRICITY AND ENERGY                  EGYPTIAN ELECTRICITY TRANSMISSION COMPANY E.E.T.C.                  EL-DOKKI GENERATION / NAGARA EL-KHAYMA</p>					
<p>EGRC</p> <p>EGYPTIAN REGULATORY AUTHORITY FOR GAS, PETROLEUM &amp; REFINERY</p> <p>EGPC</p> <p>EGYPTIAN PETROLEUM CORPORATION</p>					
<p>PROJECT: <b>توليد الكهرباء بالطاقة الشمسية بجمهورية مصر العربية</b></p>					
<p>TOWER TYPE: <b>E30 - CLASS 3</b></p>					
DESIGN		CHECKED		APPROVED	
ENGR. H. EL-SAYED		ENGR. H. EL-SAYED		ENGR. H. EL-SAYED	
JULY 2020		JULY 2020		JULY 2020	
<p>PROJECT NO: 01 - 2017</p> <p>DATE: 01/07/2020</p> <p>SCALE: 1:1</p> <p>NO. OF SHEETS: 01</p> <p>TOTAL SHEETS: 01</p>					



اطوال المدافين وكذلك المسافة بين مسامير الجتونة قبل البدء بأعمال التنفيذ



NOTES:

- 1- Foundation is designed for the following data conditions:  
 Allowable net bearing capacity = 15.00 t/m<sup>2</sup>  
 Angle of friction of soil = 30 degrees  
 Unit Weight of soil = 1.70 t/m<sup>3</sup>  
 Angle of internal friction = 26 degrees  
 No Ground Water table.
- 2- Reinforcement bars to be used should be high tensile steel (S420) of min. yield strength 3550 Kg/Cm<sup>2</sup>.
- 3- Cement to be used should be Sulphate Resisting Cement.
- 4- Concrete mix should be designed to provide the required class strength with max. amount 325 Kg/m<sup>3</sup> of cement for reinforced concrete.  
 330 Kg/m<sup>3</sup> of cement for plain concrete.
- 5- Min. cube strength (28 days) for Foundation Concrete = 25.0 Kg/Cm<sup>2</sup>.
- 6- Placing of concrete should be made without interruption.
- 7- Min. concrete cover of reinforcement bar I should be 2 cm.
- 8- Curing must be done for the first 3 days after concrete placing.
- 9- The time period between placing concrete and erection for super structure should not be less than 7 days.
- 10- The R.C. surfaces in contact with soil should be insulated by 2 layers of cold bitumen.
- 11- Back filling should be from local soil compacted in layers and each layer thickness should not exceed 25 cm and the degree of compaction of each layer should not be less than 95% of the max. dry density determined from standard proctor test.
- 12- All dimensions must be checked against the steel layout workshop drawings.
- 13- Steel Channels and reinforcement bars must have accurate projected dimensions.

EGG - CLASS 3

A		17/07/2017	17/07/2017	17/07/2017	ISSUED FOR APPROVAL	HA
REV	DATE	BY	CHKD	APPV	DESCRIPTION	SCALE



ARAB REPUBLIC OF EGYPT  
 MINISTRY OF ELECTRICITY AND ENERGY  
 EGYPTIAN ELECTRICITY TRANSMISSION COMPANY E.E.T.C.  
 EL-GHARBIYAH DESIGNSHIP FACILITY, EL-DOKKI

DESIGNED BY

EGTCC

STRUCTURE & GEOTECHNICAL RESEARCH CENTER  
 FROM 6 DEAF ADELKATIAN  
 Address: 5 Mohamed El-Nehary St. Helwan - Cairo - Egypt  
 Tel: 011 535714147 - 53114148

PROJECT:

توليد الكهرباء من المحطبة جوهنة 66 ك.ف

TOWER TYPE

EGG - CLASS 3

DATE	BY	CHKD	APPV
DESIGN	SOHEIB BAKAL	HA	JULY 2017
CHECKED	EMAD EL KHALAF	HA	JULY 2017
APPROVED	EMAD EL KHALAF	HA	JULY 2017
PROJECT NO.	EG - 2017	SCALE	1:1
DATE	19/11/2017	BY	HA
SCALE	1:1	CHKD	HA

REV

ID	Length (mm)	Number (Bar)	Total Length (m)	Weight (Kg)
24	3.85	24	92.40	213.42
18	5.00	60	300.00	720.00
16	5.20	60	312.00	748.80
10	19.0	10	190.00	455.00
12	1.50	20	30.00	71.50

275.35

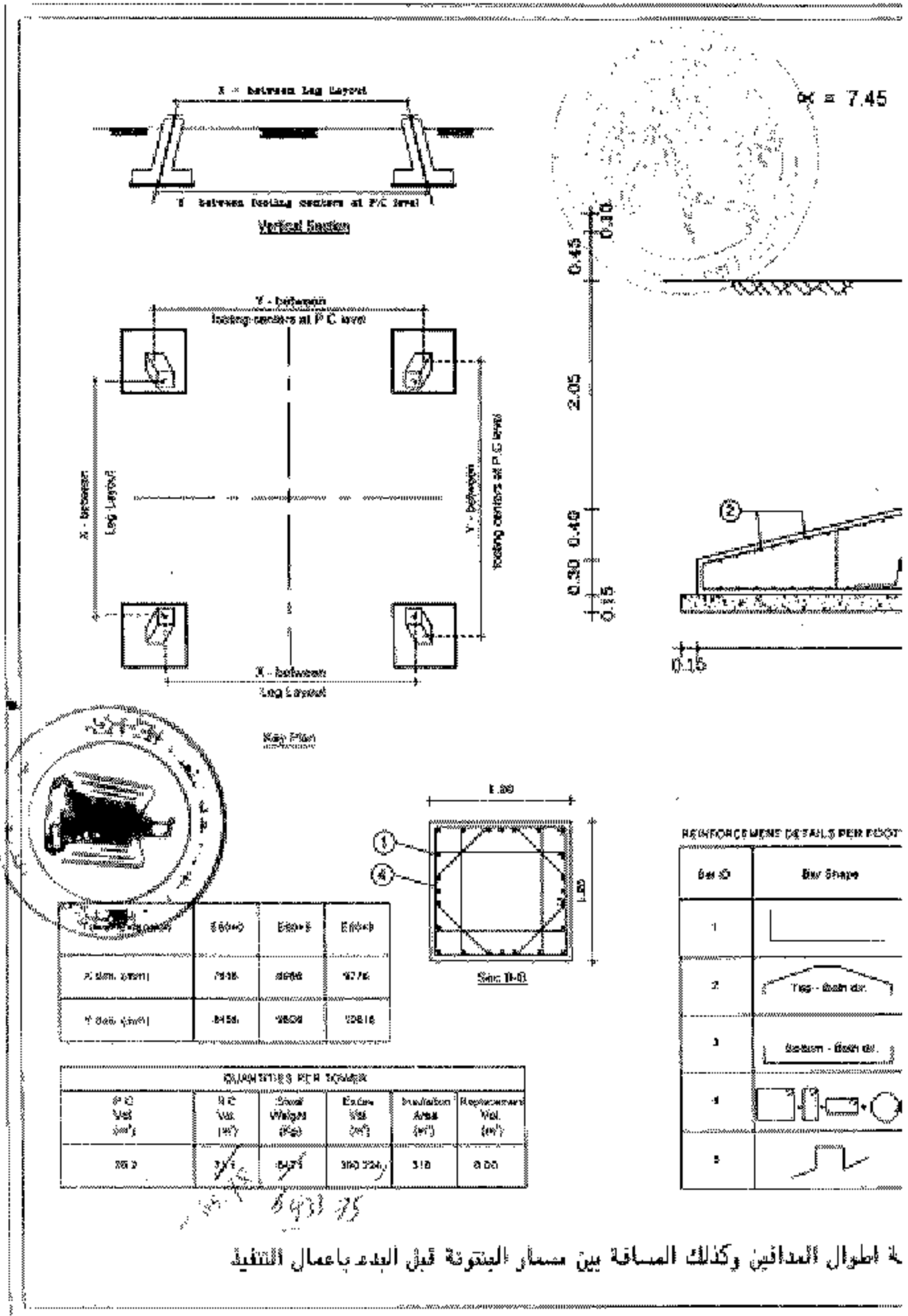
556.47

319.80

185.00

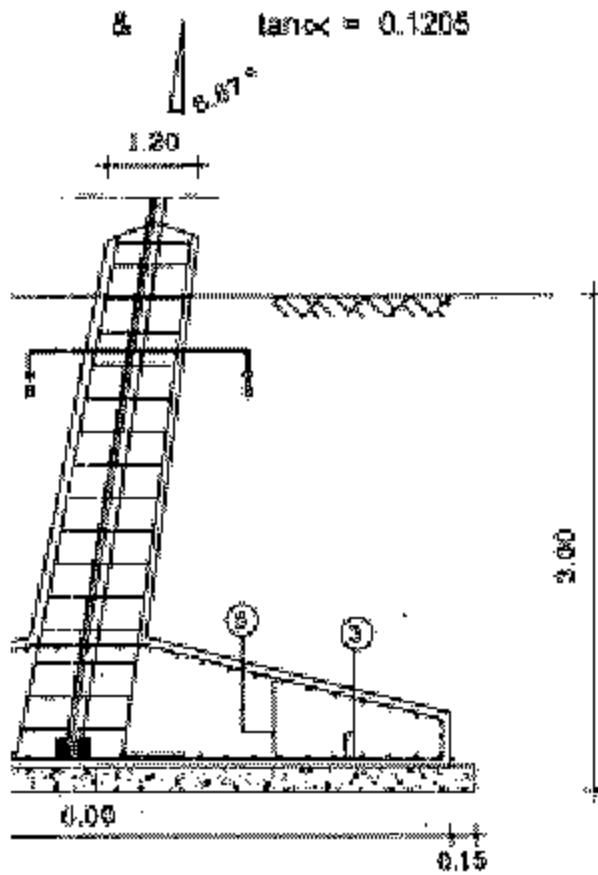
1608.43

على المقاول المتخذة مراجعته



في اطرال المدافين وكذلك المسافة بين مسار الجتونة قبل البدء باعمال التنفيذ





NOTES:

1. Foundation and design for the tower shall be as follows:
  - Allowable net bearing capacity = 18.00 kg/cm<sup>2</sup>
  - Angle of friction of soil = 30 degree
  - Unit weight of soil = 1.70 kg/cm<sup>3</sup>
  - Angle of internal friction = 30 degree
  - No Ground Water table.
2. Reinforcement bars to be used should be high tensile steel (S552) of min yield strength 5500 kg/cm<sup>2</sup>.
3. Cement to be used should be Sulphate Resisting Cement.
4. Concrete mix should be designed to provide the required cube strength with min. amount:
  - 380 kg/m<sup>3</sup> of cement for reinforced concrete.
  - 350 kg/m<sup>3</sup> of cement for plain concrete.
5. Min. cube strength (28 days) for Foundation Concrete = 350 kg/cm<sup>2</sup>
6. Placing of concrete should be made without interruption.
7. Min. concrete cover of reinforcement bars should be 40 mm.
8. Curing must be done for the first 7 days after concrete placing.
9. The time period between placing concrete and erection the upper structure should not be less than 7 days.
10. The R.C. surfaces in contact with soil should be treated by 3 layers of 100% Bitumen.
11. Back filling should be from local soil compacted in layers and each layer thickness should not exceed 15 cm and the degree of compaction of each layer should not be less than 95% of the theoretical density determined from standard proctor test.
12. All dimensions shall be checked against the final tower workshop drawings.
13. Piles, Columns and replacement layers have required projected dimensions.

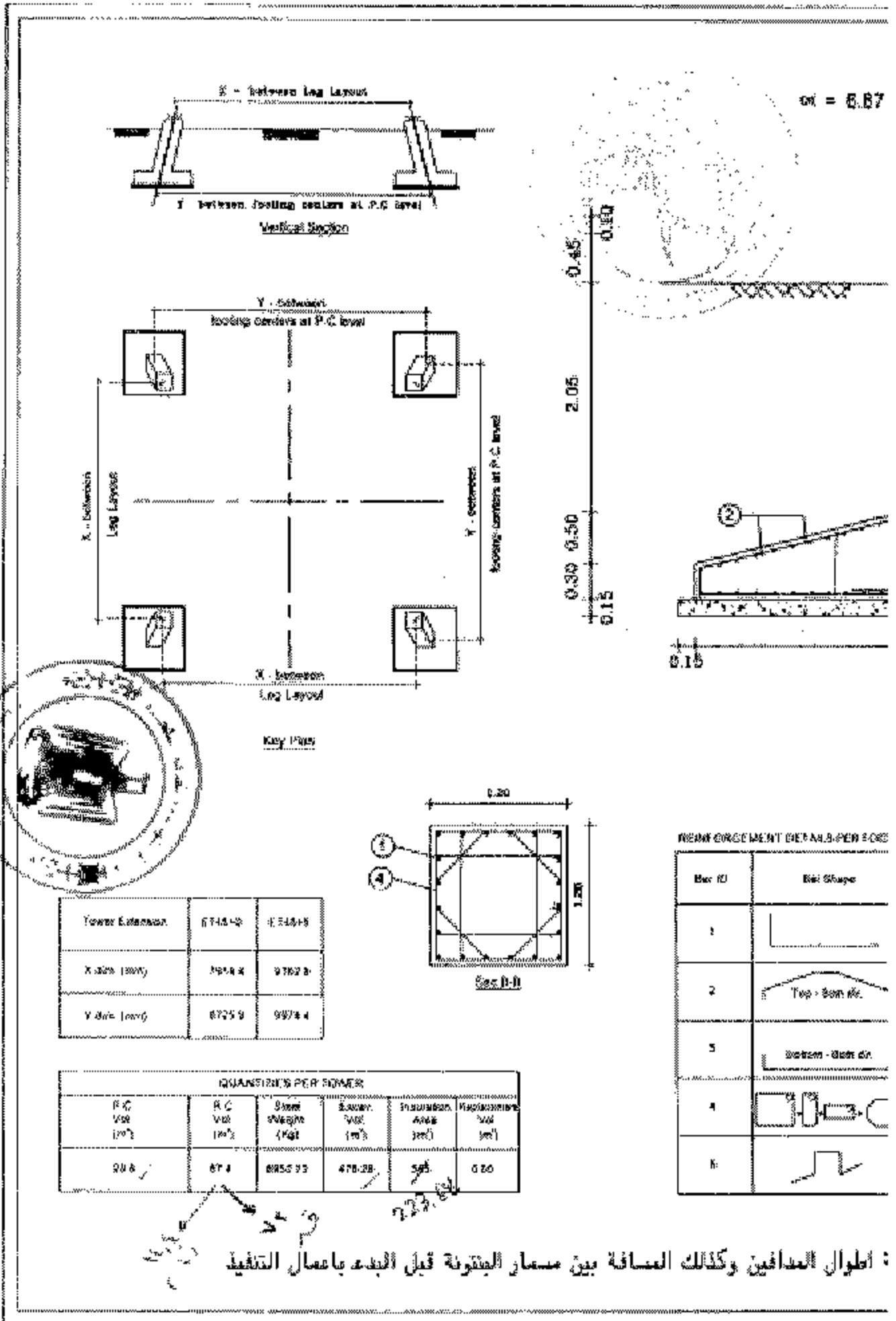
ET45 - CLASS 3

<p>ARAB REPUBLIC OF EGYPT                  MINISTRY OF ELECTRICITY AND ENERGY                  EGYPTIAN ELECTRICITY TRANSMISSION COMPANY E.E.T.C                  EL SHARAH GENERATION PLANT 660 KV</p>					
<p><b>SGRC</b>                  STRUCTURE &amp; GEOTECHNICAL RESEARCH CENTER                  1001 EL ELWANEY EL KHAYMA EL KHAYMA EL KHAYMA                  EL KHAYMA EL KHAYMA EL KHAYMA EL KHAYMA                  TEL: 0100 0100 0100 0100</p>					
<p><b>PROJECT</b>                  توكيف الكابلات الجهدية بجهد 66 ك.ف</p>					
<p><b>RESEARCH TYPE:</b> ET45 - CLASS 3</p>					
<b>DESIGNED</b>		<b>CHECKED</b>		<b>APPROVED</b>	
SHERIF HANAN		ELWANEY EL KHAYMA		ELWANEY EL KHAYMA	
01-2024		01-2024		01-2024	
<b>DATE</b>		<b>DATE</b>		<b>DATE</b>	
01-2024		01-2024		01-2024	
<b>NO.</b>		<b>NO.</b>		<b>NO.</b>	
01-2024-01-01-01		01-2024-01-01-01		01-2024-01-01-01	

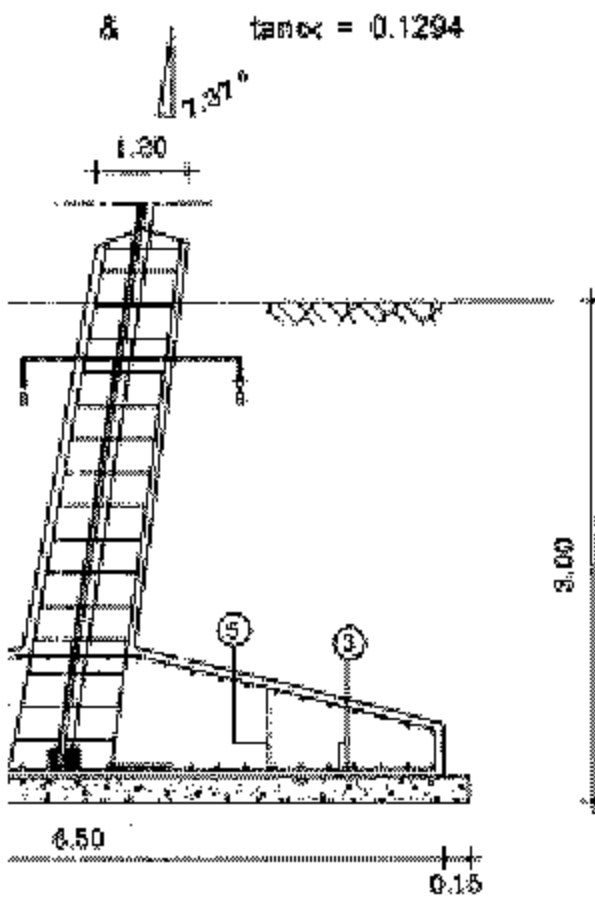
TABLE

ID	Length (mm)	Number (Nos)	Total Length (m)	Weight (Kg)
12	5.95	24	142.8	253.07
16	6.40	28	102.4	185.85
18	8.50	28	154.00	275.95
20	12.8	19	243.2	437.7
22	1.30	20	26.00	43.15

على المقاول المتقيد مراجعاً  
 Ky 9/108.96  
 2298



أطوال العداقين وكذلك المسافة بين مسامير الخرسانة قبل البدء بأعمال التنفيذ :



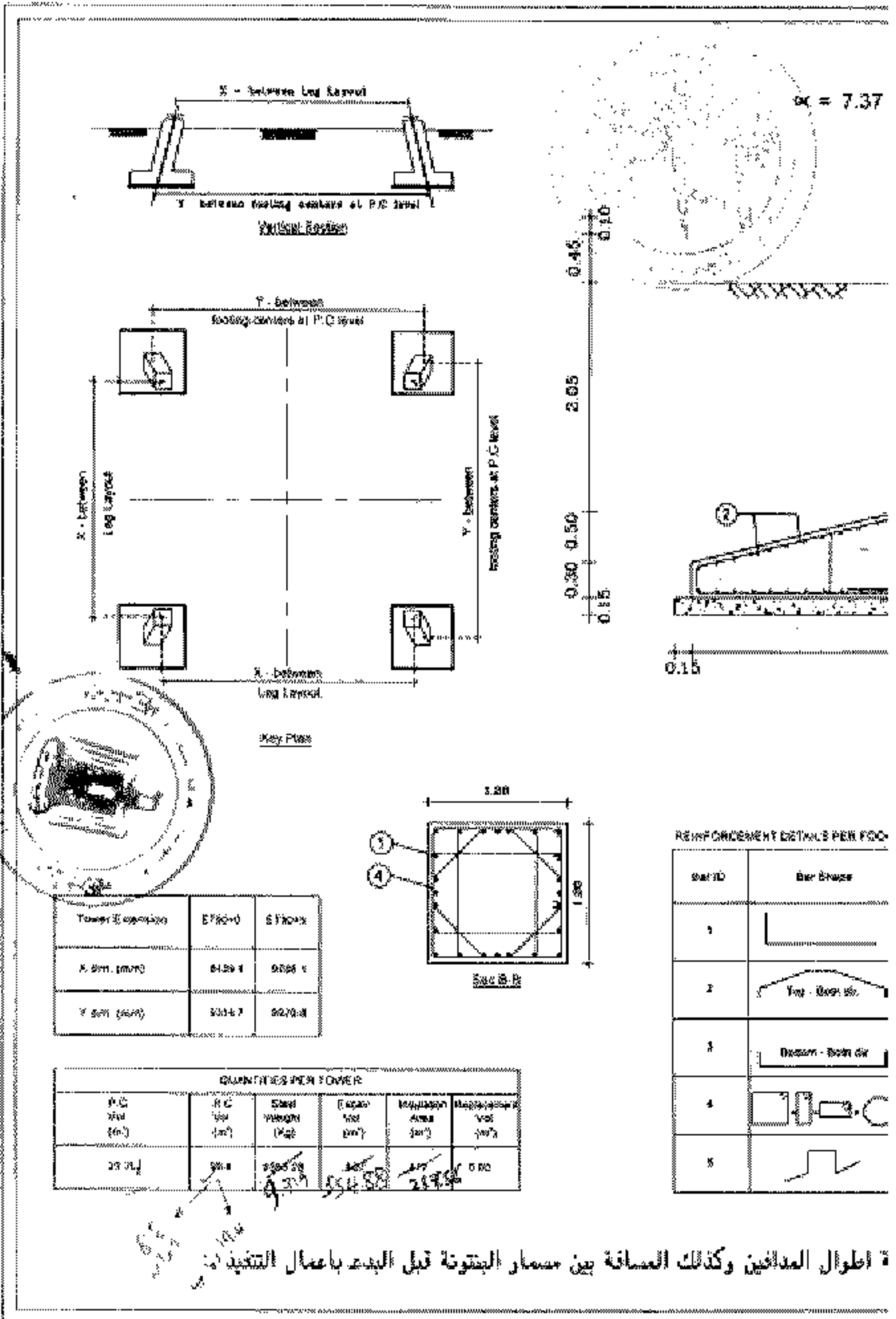
- NOTES**
- 1- Foundations are designed for the following soil conditions:  
 Allowable soil bearing capacity = 1000 kpa  
 Angle of friction of soil = 30 degree  
 Unit weight of soil = 170 kN/m<sup>3</sup>  
 Angle of critical failure = 20 degree  
 No Ground Water table
  - 2- Reinforcement bars when used should be high tensile steel (34/32) of min. yield strength 3550 kg/cm<sup>2</sup>
  - 3- Cement to be used should be Sulphate Resisting Cement
  - 4- Concrete mix should be designed to provide the required cube strength with min. amounts:  
 300 kg/m<sup>3</sup> of cement for reinforced concrete  
 200 kg/m<sup>3</sup> of cement for plain concrete.
  - 5- Min. cube strength (28-days) for Foundation Concrete = 250 kg/cm<sup>2</sup>
  - 6- Placing of concrete should be made without interruption
  - 7- Min. concrete cover of reinforcement bars should be 8 cm.
  - 8- Curing must be done within first 3 days after concrete placing
  - 9- The time period between placing concrete and erection of the super structure should not be less than 7 days.
  - 10- The 30 C. surface in contact with soil should be covered by 3 layers of asphaltum.
  - 11- Back filling should be loose loose well compacted in layers and each layer thickness should not exceed 25 cm and the degree of compaction of each layer should not be less than 95% of the max. dry density determined from standard proctor test.
  - 12- All dimensions must be checked against the steel tower workshop drawings.
  - 13- Piles, Chimneys and replacement layers have equalled project's dimensions.

**ET90 - CLASS 3**

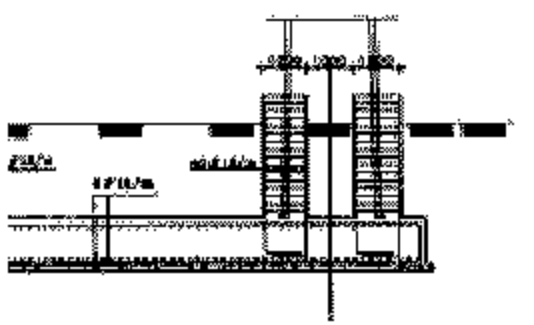
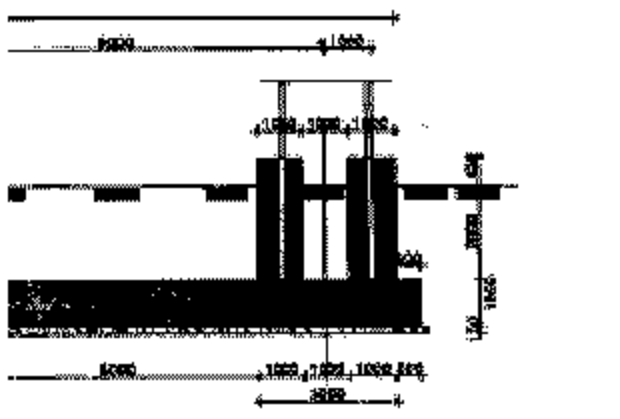
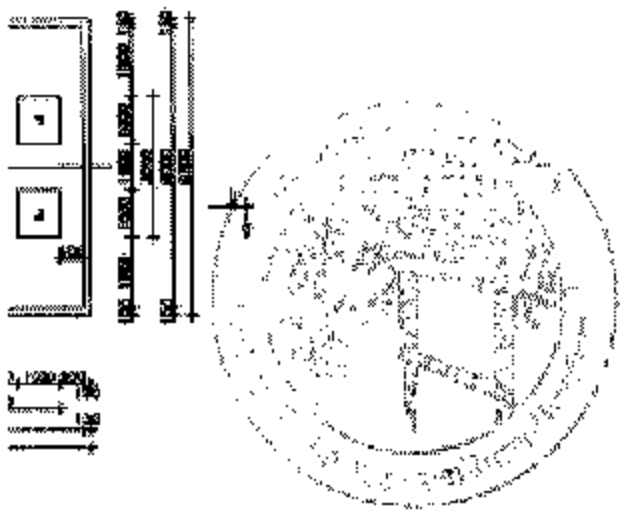
Ø (mm)	Length (m)	Number (bars)	Total Length (m)	Weight (kg)
22	3.00	24	72.00	287.75
18	4.80	50	240.00	599.98
16	4.80	50	240.00	545.47
10	19.8	19	198.00	185.22
12	1.80	49	88.20	64.78
				2423.9

على المتاول التنفيذ مراجع

<p>ARAB REPUBLIC OF EGYPT                  MINISTRY OF ELECTRICITY AND ENERGY                  EGYPTIAN ELECTRICITY TRANSMISSION COMPANY E.E.T.C.                  (ELSHARBIYA GENERAL RATION) EL SHARBIYA 58 KM</p>					
<p>تمت الموافقة على</p> <p><b>SGRC</b>                  STRUCTURE &amp; GEOTECHNICAL RESEARCH CENTER                  PROF. ELWALID ABDEL HAFIZ AND. EMMANUEL                  Address: 5, Alsharbiya Area 58 km Sharbiya - Cairo - Egypt                  Tel: (9952) 24 14840 - 2414854</p>					
<p><b>PROJECT:</b> مشروع التأسيس / الجغرافية / جهد 66 ك.ف.ب</p>					
<p><b>TOWER TYPE:</b> ET90 - CLASS 3</p>					
DESIGN		DATE		BY	
CHECKED		DATE		BY	
APPROVED		DATE		BY	
<p>DESIGNED BY: E.M. ELWALID</p> <p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>	
<p>DESIGNED BY: E.M. ELWALID</p> <p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>	
<p>DESIGNED BY: E.M. ELWALID</p> <p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>	
<p>DESIGNED BY: E.M. ELWALID</p> <p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>		<p>DATE: 01-2017</p>	



أطوال المدافين وكذلك العمافة بين حصار البتونة قبل البدء بأعمال التنفيذ:



QUANTITIES :-

	P.C. m <sup>3</sup>	R.C. m <sup>3</sup>	REINFC. kg	EXCERD. m <sup>3</sup>	REINFC. m <sup>3</sup>	FOUNDATION m <sup>3</sup>
6 FOOTING	31.97	33.48	242.34	368.47	00.00	334.86

Handwritten annotations: 13.8, 307.05, 334.86

**NOTES:**

- 1- Foundation are designed for the following soil conditions:  
 Allowable net bearing capacity = 18,000 kPa  
 Angle of friction of soil = 30 degree  
 Unit Weight of soil = 1.70 kN/m<sup>3</sup>  
 Angle of external friction = 22 degree  
 No Ground Water table.
- 2- Reinforcement bars to be used should be high tensile steel (S202) of min. yield strength 5000 Kg/CM<sup>2</sup>
- 3- Cement to be used should be Sulphate Resisting Cement.
- 4- Concrete mix should be designed to provide the required cube strength with min. amount 300 Kg/CM<sup>3</sup> of cement for reinforced concrete.  
 250 Kg/CM<sup>3</sup> of cement for plain concrete.
- 5- Min. cube strength (28 days) for Foundation Concrete = 200 Kg/CM<sup>2</sup>
- 6- Casting of concrete should be made without interruption.
- 7- Min. concrete cover of reinforced concrete should be 5 cm.
- 8- Compaction to be done for the first 3 days after concrete placing.
- 9- The free period between placing concrete and erection the super structure should not be less than 7 days.
- 10- Top R.C. surfaces in contact with soil should be treated by 3 layers of cast bitumen.
- 11- Steel Mats should be horizontal and perpendicular layers and each layer thickness should not exceed 25 cm and the degree of compaction of each layer should not be less than 60% of the max. dry density determined from standard proctor test.
- 12- All dimensions must be checked against the steel lower working drawings.
- 13- Piles, Charveys and Reinforcement layers have required projected dimensions.

هذا المخطط الإنشائي برأيه المرات الساتين وكذلك التسمية بين سمار الكهروم في الكهروم باسكال الكهرو

**PORTAL (EPT45+3m)**


	DESIGNED BY	CHECKED BY	ENGINEER	DESIGNED FOR APPROVAL	
	DATE	DATE	NAME		P.E.
	REVISION	REVISION	REVISION		SEC. REVIEW
					DATE

ARAB REPUBLIC OF EGYPT  
 MINISTRY OF ELECTRICITY AND ENERGY  
 EGYPTIAN ELECTRICITY TRANSMISSION COMPANY S.E.T.C  
 EL SHABAB GENERATION / AL GAFARIA 60 KV DCTL

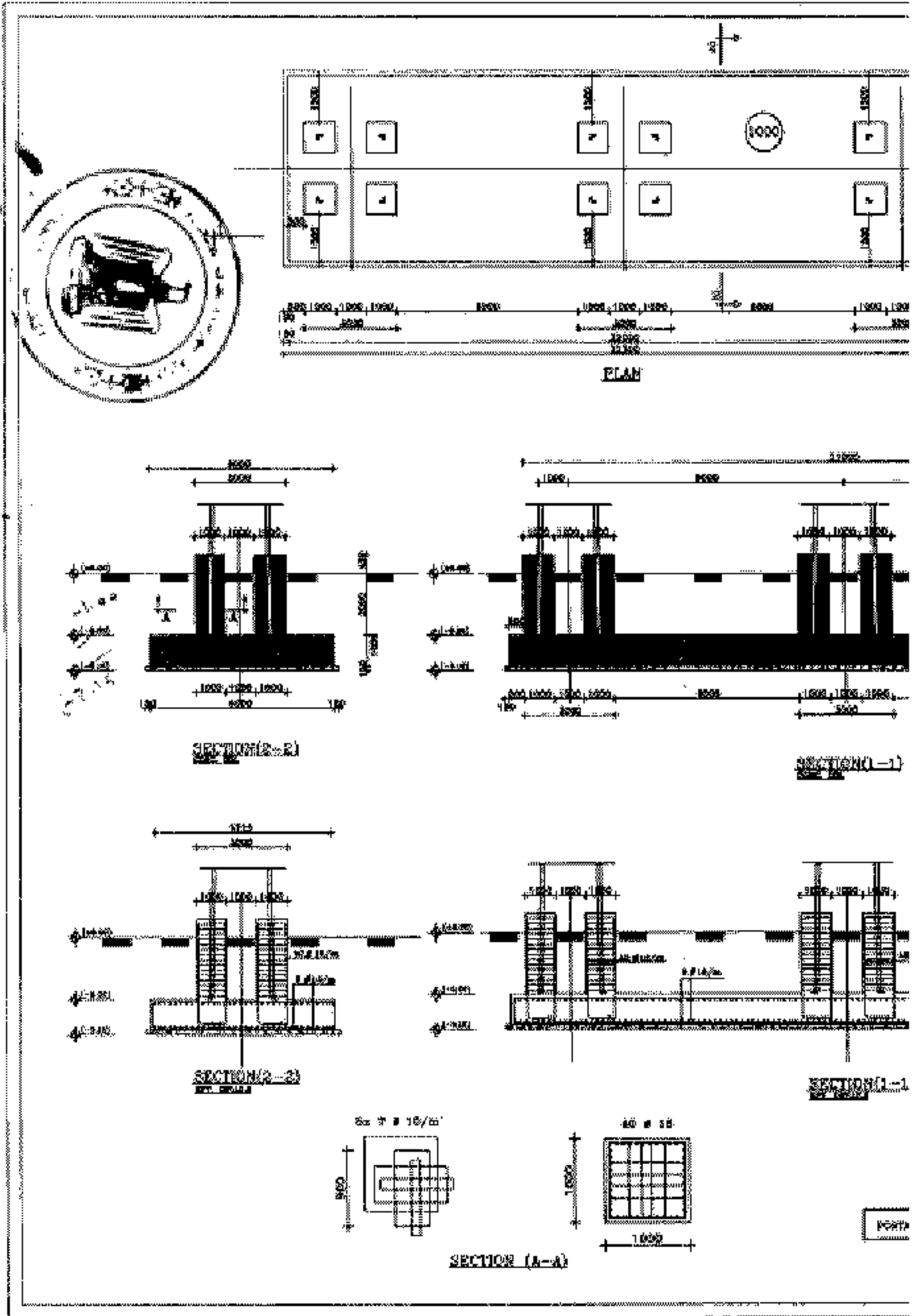
APPROVED BY: **SGRC**  
 STRUCTURAL & MECHANICAL RESEARCH CENTER  
 PROP. EQUIPMENT/TAH  
 Address: Heliopolis, El-Dokki, Giza - Egypt  
 Tel: (202) 47233001-3 (direct)

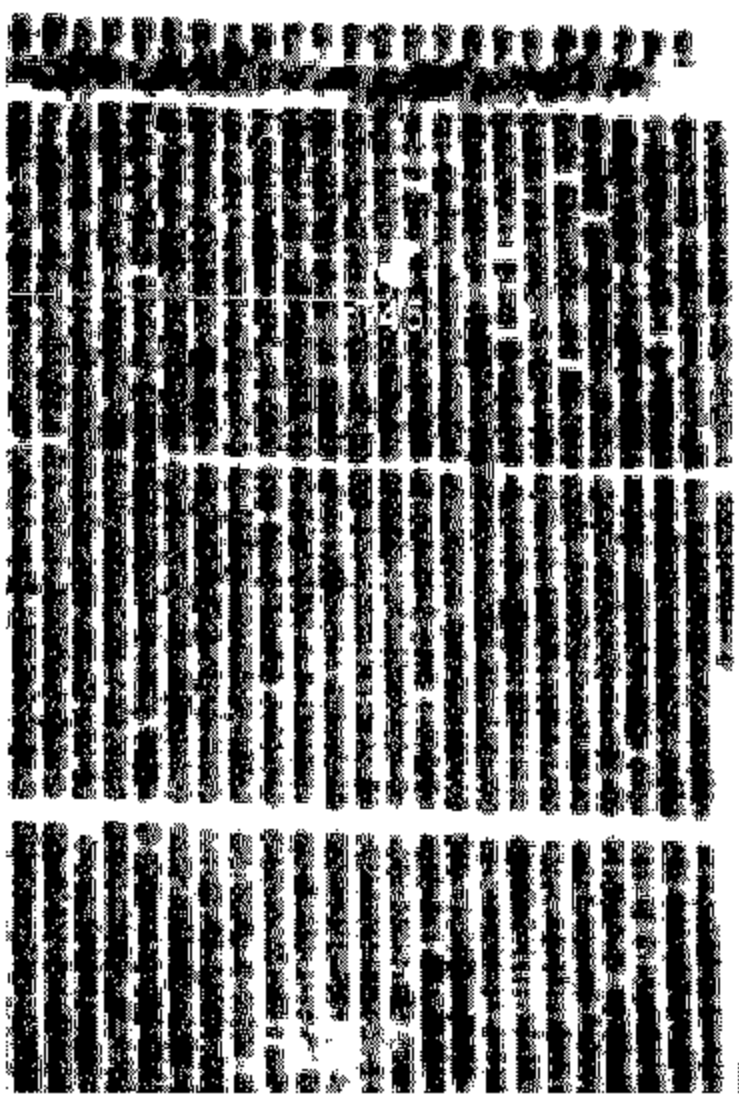
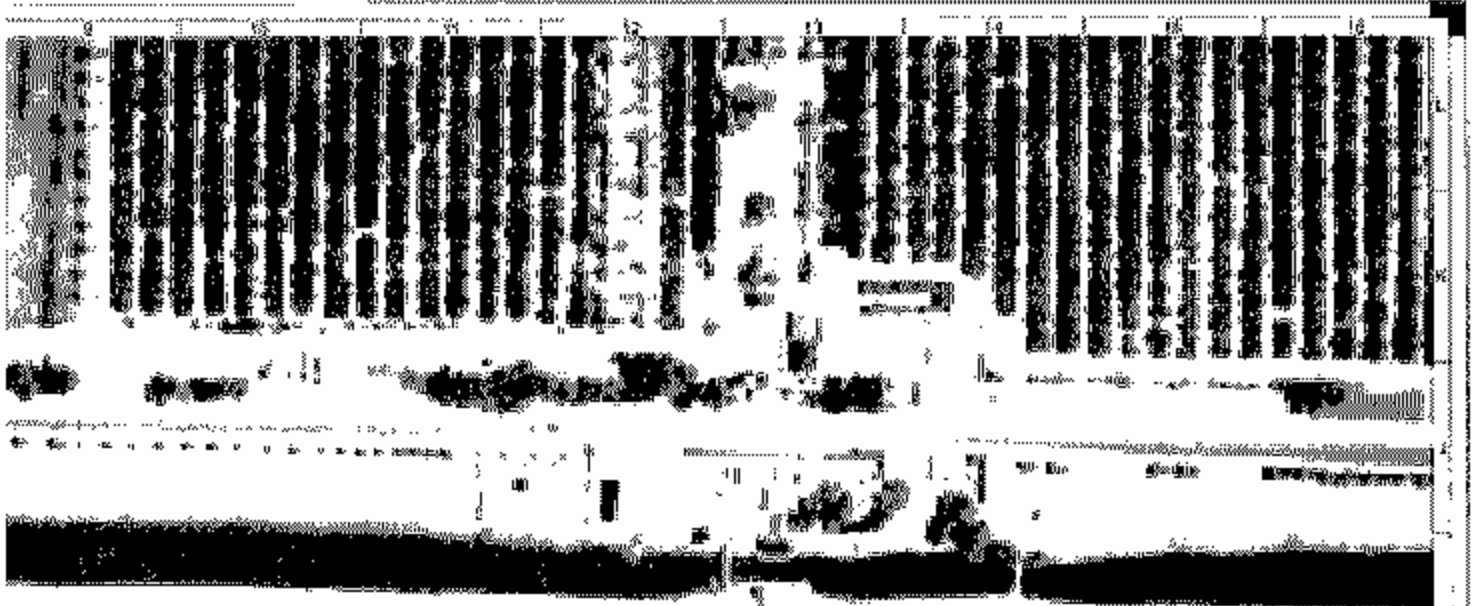
PROJECT: **TAWLEED SHABAB - GAFARIA 60 KV DCTL**

OWER TYPE: **PORTAL FOUNDATION (EPT45+3m)**

DESIGNED		DATE
BROWN	ENG. ABDEL MONEM	JULY 2017
CHECKED	ENG. S. HAD	JULY 2017
APPROVED	ENG. EM. ELBA	JULY 2017

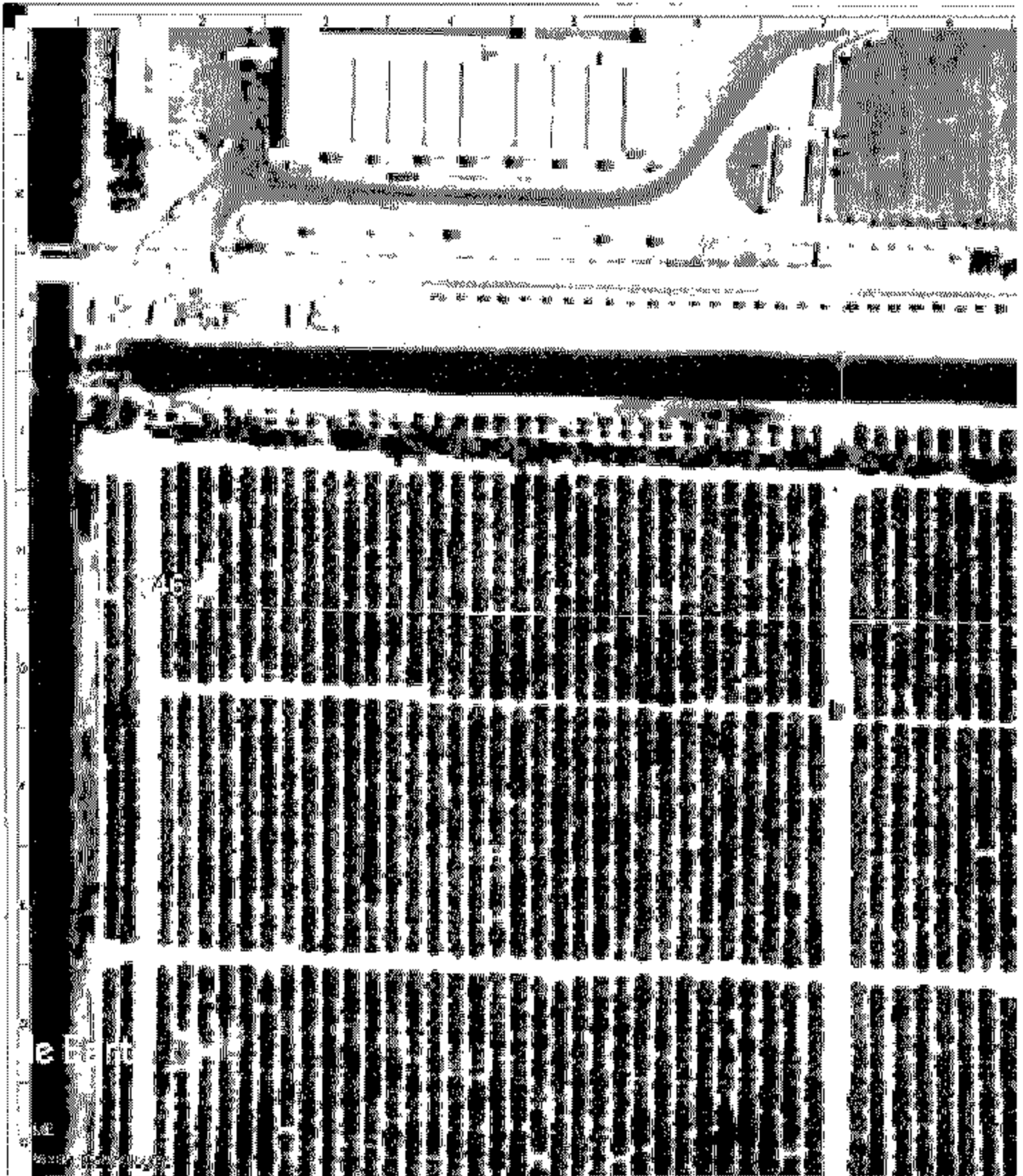
SCALE	1:10	DATE	11.15
REVISION	178-BA-004-0100 - 02	NO.	47
DATE		APPROVED	62
DATE		DESIGNED	6





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TOWERS COORDINATES :

Point	Easting	Northing
TOWER 45	306447.186	3371984.320
TOWER 46	306090.957	3371986.867

PROJECTION : UTM  
 ZONE : 36  
 DATUM : WGS 1984



