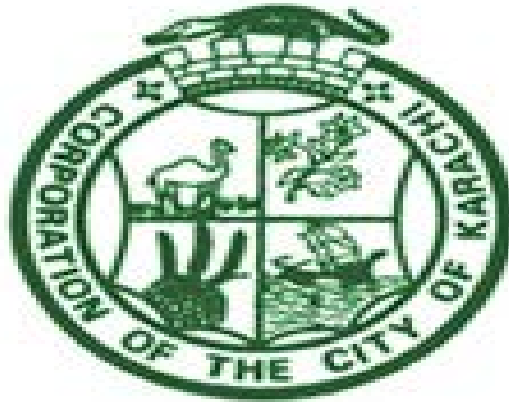


VOLUME-II

KARACHI METROPOLITAN CORPORATION
TRANSPORT & COMMUNICATION DEPARTMENT



NAME OF WORK: INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING TRAFFIC SIGNALS IN KARACHI (ZONE-I)

TENDER REFERENCE NO:DIR/TC&O/T&C/2015/

BILL OF QUANTITIES

FINANCIAL PROPOSAL

NOTE: PLEASE DETACH THIS PORTION, FILL IT, DULY SIGNED AND STAMPED. SEAL IT IN SEPARATE ENVELOPE CLEARLY MARKING ON THE ENVELOPE FINANCIAL PROPOSAL WITH NAME OF PROJECT.

BOQ

NAME OF WORK: INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING TRAFFIC SIGNALS IN KARACHI (ZONE-I)

S.NO	ITEM	QTY OR NOS	RATE	UNIT	AMOUNT
1	Routine maintenance of traffic light signal equipment of UTC and NON-UTC system as per terms & conditions and scope of maintenance attached and as instructions and direction of the Engineer In charge. (Signals 24 Hours Running)	35 juncts for 12 months		month/junct.	
2	Routine maintenance of traffic light signal equipment of UTC and NON-UTC system as per terms & conditions and scope of maintenance attached and as instructions and direction of the Engineer In charge. (Signal 24 hours switch off by traffic police)	24 juncts for 12 months		month/junct.	
3	Routine maintenance of Sollar Flasher at various locations as per terms & conditions and scope of maintenance attached and as instructions and direction of the Engineer In charge.	10 sites for 12 months		month/site	
	SUB TOTAL				
4	CHARGEABLE MAINTENANCE OF SIGNALS				
4-A	SUPPLY AND REPLACEMENT OF PARTS.				
4-B	INSTALLATION / DISMANTLING CHARGES OF PARTS.				
4-A	SUPPLY AND REPLACEMENT OF PARTS.				
	<u>PARTS OF T-400 CONTROLLER</u>				

1	CONTROLLER BASE	2		Each	
2	MAIN PROCESSOR CARD	1		Each	
3	4-PHASE DRIVER CARD	12		Each	
4	POWER SUPPLY UNIT	12		Each	
5	H.R.C.FUSE	1		Each	
6	CAPACITOR	1		Each	
7	CLOCK MODULE	3		Each	
8	BATTERY	2		Each	
	<u>PARTS OF ST-800 CONTROLLER</u>				
8	POWER SUPPLY UNIT	5		Each	
9	C P U	1		Each	
10	8-PHASE DRIVER CARD	5		Each	
	<u>PARTS OF SIMATIC OR EQUVILENT CONTROLLER</u>				
11	SIMATIC OR EQUVILENT CONTROLLER	2		Each	
12	CENTRAL PROCESSING CARD	1		Each	
13	POWER SUPPLY	4		Each	
14	RELAY OUT PUT CARD	12		Each	
15	ELECTRIC FLASHER	5		Each	
16	CONTROLLER CASING	1		Each	

17	BACKUP BATTERY	2		Each	
	<u>SIGNAL HEADS POLY CARBONIZED</u>				
18	3-WAY ASPECT 200 MM	1		Each	
19	3-WAY ASPECT 200 MM (WITH LED BALL)	10		Each	
20	3-WAY ASPECT 300 MM	1		Each	
21	3-WAY ASPECT 300 MM (WITH LED BALL)	6		Each	
22	2-WAY ASPECT 200 MM	1		Each	
23	2-WAY ASPECT 200 MM (WITH LED BALL)	2		Each	
24	1-WAY ASPECT 300 MM	1		Each	
25	1-WAY ASPECT 300 MM (WITH LED BALL)	1		Each	
26	1-WAY ASPECT 200 MM	24		Each	
27	1-WAY ASPECT 200 MM (WITH LED BALL)	12		Each	
28	PEDESTRIAN PUSH BUTTON	1		Each	
	-				
	<u>PARTS OF 200 MM SIGNAL HEADS</u>				
29	GLASS	35		Each	
30	HOOD	35		Each	
31	RUBBER GASKIT	1		Each	
32	REFLECTOR	1		Each	

33	MOUNTING BRACKET	5		Each	
34	ARROW BRACKET	5		Each	
35	ARROW MASK	1		Each	
36	LED BALLS 200 MM	100		Each	
	<u>PARTS OF 300 MM SIGNAL HEADS</u>				
37	GLASS	1		Each	
38	HOOD	1		Each	
39	RUBBER GASKIT	1		Each	
40	REFLECTOR	1		Each	
41	ARROW BRACKET	1		Each	
42	HANGING BRACKET	2		Each	
43	ARROW MASK	1		Each	
44	LED BALLS 300 MM	35		Each	
45	STANDARD POLE AS PER EXISTING SAMPLE	1		Each	
46	CONSTRUCTION OF FOUNDATION FOR STANDARD POLE (COMPLETE) AS PER SPECS.	12		Each	
47	MAST ARM POLE AS PER EXISTING SAMPLE	1		Each	
48	CONSTRUCTION OF FOUNDATION FOR MAST ARM POLE (COMPLETE) AS PER SPECS.	6			

49	SUPPLY & LAYING OF 1 NO GI PIPE (H.D) 4" DIA IN DUCT UNDER THE ROAD CARRIAGE WAY / FOOTWAY I/C COST OF CONSTRUCTION OF DUCT AND MAKING GOOD THE ROAD COMPLETE AS PER DIRECTION OF THE ENGINEER INCHARGE.	10		METER	
50	SUPPLY & LAYING OF 1 NO GI PIPE (H.D) 2" DIA IN DUCT UNDER THE ROAD CARRIAGE WAY / FOOTWAY I/C COST OF CONSTRUCTION OF DUCT AND MAKING GOOD THE ROAD COMPLETE AS PER DIRECTION OF THE ENGINEER INCHARGE.	10		METER	
51	CABLE 12 CORE ARMoured PVC/PVC COPPER CONDUCTOR	850		METER	
52	KESC BOX (BREAKER30.A, INDICATION LAMP, VOLT METER)	12		Each	
53	POWER CABLE 3 CORE 6MM	280		METER	
54	AUTOCHANGEOVER SWITCH (COMPLETE)	1		Each	
55	CIRCUIT BREAKER 30 A	5		Each	
56	CONTACTOR	1		Each	
57	TIMER	1		Each	
58	RECONSTRUCTION OF OLD CHAMBER	12		Each	
59	REPAIR OF OLD CHAMBER	12		Each	
60	PROVIDING & FIXING OF CHAMBER COVER	12		Each	
61	DUCT WITH (PVC) PIPE 2" DIA	60		METER	
62	REPAIR OF STANDARD POLE	1		Each	

63	REPAIR OF MAST ARM POLE	1		Each	
64	POLE COVER FOR MAST ARM POLE	24		Each	
65	POLE COVER FOR STANDARD POLE	35		Each	
66	REPAIR OF MAST ARM POLE FOUNDATION	1		Each	
67	REPAIR OF STANDARD POLE FOUNDATION	1		Each	
68	REPAIR OF POWER SUPPLY ST-800 AND T-400 CONTROLLER	24		Each	
69	FRONT DOOR OF CONTROLLER CASING T-400, ST-800	1		Each	
70	BACK DOOR OF CONTROLLER CASING T-400, ST-800	1		Each	
71	REPAIR OF CONTROLLER CASING T-400, ST-800	5		Each	
72	WIRE 7/ 36	10		METER	
73	WIRE 12 CORE PVC / PVC COPPER CONDUCTOR	10		METER	
74	COUNT DOWN TIMER COMPLETE 12"	24		Each	
75	POWER SUPPLY UNIT FOR LED BALL	35		Each	
76	SOLLAR FLASHER IN 200 MM LIGHT ASPECT	1		Each	
77	UPS 1000 WATT SIGN WAVES	1		Each	
78	DRY BATTERY 100 AMP MAINTENANCE FREE	2		Each	
79	DRY BATTERY 12 AMP MAINTENANCE FREE	10			
80	SOLLAR PANNEL 10 WATT	10			
81	GI PIPE 4 INCH DIA 10 FEET HIGH WITH FOUNDATION	5			
	SUB-TOTAL				

4-B	INSTALLATION / DISMANTLING CHARGES OF PARTS.				
1	T-400 OR ST-800 CONTROLLER 16 PHASE INCLUDING COMMISSIONING & TESTING WITH RE- BLOWING OF EPROM.	1		Each	
2	T-400 OR ST-800 CONTROLLER 8 PHASE INCLUDING COMMISSIONING & TESTING WITH RE- BLOWING OF EPROM.	1		EACH	
3	SIMATIC OR EQUVILENT CONTROLLER INCLUDING COMMISSIONING & TESTING	1		Each	
4	MAIN PROCESSOR CARD	1		Each	
5	4 OR 8 PHASE DRIVER CARD	1		Each	
6	POWER SUPPLY UNIT	1		Each	
7	HRC FUSE	2		Each	
8	CAPACITOR	2		Each	
9	BATTERY T-400	10			
	<u>SIGNAL HEADS POLY CARBONIZED</u>				
10	3-WAY ASPECT 200 MM	10		Each	
11	3-WAY ASPECT 300 MM	5		Each	
12	2-WAY ASPECT 200 MM	5		Each	

13	1-WAY ASPECT 300 MM	5		Each	
14	1-WAY ASPECT 200 MM	5		Each	
15	PEDESTRIAN PUSH BUTTON	1		Each	
	<u>PARTS OF 200 MM SIGNAL HEADS</u>				
16	GLASS	1		Each	
17	HOOD	1		Each	
18	RUBBER GGASKIT	5		Each	
19	REFLECTOR	5		Each	
20	MOUNTING BRACKET	1		Each	
21	ARROW BRACKET	1		Each	
22	ARROW MASK	5		Each	
	<u>PARTS OF 300 MM SIGNAL HEADS</u>				
23	GLASS	10		Each	
24	HOOD	10		Each	
25	RUBBER GASKIT	5		Each	
26	REFLECTOR	5		Each	
27	ARROW BRACKET	1		Each	
28	HANGING BRACKET	1		Each	
29	ARROW MASK	5		Each	

	<u>OTHER PARTS</u>				
30	STANDARD POLE AS PER EXISTING SAMPLE	25		Each	
31	MAST ARM POLE AS PER EXISTING SAMPLE	10		Each	
32	LAYING OF CABLE 12 CORE	300		METER	
	SUB TOTAL				
	ROUTINE MAINTENANCE				
	CHARGEABLE MAINTENANCE				
	TOTAL				

DETAIL OF WORK

NAME OF PROJECT

INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING TRAFFIC SIGNALS IN KARACHI (ZONE-I)

SUMMARY / SCOPE OF WORK:

KMC intend to Improvement / Installation and Up-gradation of existing signals including routine checkup of system and make in functional condition. The traffic signal of Karachi at the various locations as per detail analysis of required and traffic demand. The scheme has been approved by the competent authority. The signals are already in operation at various locations of the city controlled by KMC. The list is attached for ready reference.

ESTIMATED COST OF THE SUBJECT WORK RS. 13425780/=

SORCE OF FUNDING:

KMC Budget / District Annual Development Program

AMOUNT & TYPE OF FINANCING:

KMC Budget / District Annual Development Program

METHOD OF PROCUREMENT USED

SINGLE STAGE –ONE ENVELOPE PROCEDURE (RULE 46 (1) OF SPP RULE 2010)

46 (1) SINGLE STAGE – ONE ENVELOPE PROCEDURE

- a) Notice Inviting Tender and bidding documents of this method shall contain the following eligibility criteria:

The following works from Firm / Contractors Registered with P.E.C in C-5

Category and having valid/renewed license of PEC.

Valid NTN and paid up original challan of professional Tax prescribed fee.

The bidders shall provide evidence to the satisfaction of employer of their eligibility and their capability and adequacy of resources to carryout the contract effectively.

Tenders will be issued to those firms/contractors who provide proof & Experience Certificate from the concerned department of at least 4 years for the maintenance work on Siemens T-400/ST-800 controllers and firm also have the experience to install demand response system in current installed T-400, ST-800 Siemens traffic controller .

The Firm/Contractor must have sufficient experience in execution, running, repairing and maintenance of traffic light signals equipments of an Urban Traffic Control System Specially in Siemens T-400 and ST-800 Controllers.

The Firm /Contractor must have work shop laboratory duly equipped with necessary tools and software required for reconfiguration of controller, repairs of phase driver card, power supply and central processing unit for Siemens T-400 and ST-800 Controllers.

The Firm / Contractor have must sufficient inventory / procurement arrangement of Genuine Spare Parts of Traffic Signal equipment.

- b) All bids received shall be opened and evaluated in the manner prescribed in the Notice Inviting Tender or bidding document.

Minimum Qualification / Eligibility Criteria*

The evidence / documents of the following minimum qualification / eligibility criteria will be checked during opening process of tender & if anyone is missing then the tender will be summarily rejected at the moment by the tender opening committee.

Eligibility:

- Valid PEC in C-5 category along with special category for signalization work EE-06, EE-07 & CE-10.
- Electrical License of the firm issued from Government of Sindh.
- Valid Professional TAX Certificate.
- Minimum last four years experience in Existing Signaling system with any public sector / organization.
- NTN Certificate

Minimum Qualification Criteria:

- Bid Security, as mentioned in the NIT & Bidding Documents, is furnished.
- All rates quoted including the total amount of the bid shall be in figures & words (both).
- All corrections / overwriting shall be clearly re-written with initials & duly stamped by the bidder.
- The bid shall be properly signed, named & stamped by the authorized person of the firm and authorization letter for signatory shall be enclosed with the tender by the authorized person, if other than the signatory of the firm.
- Evidence of employing Engineer as declared in the PEC License should be provided in shape of copy of Engineer's Registration certificate by PEC.
- Bank certificate of firm.
- The minimum work experience with satisfactory completion report in last 3 years in Maintenance/Installation of traffic signals in scoot system.

**APPENDIX “A”
LIST OF INTERSECTION
NAME**

**LIST OF TRAFFIC SIGNALS UNDER TRANSPORT & COMMUNICATION DEPARTMENT SOUTH
(ZONE-1)**

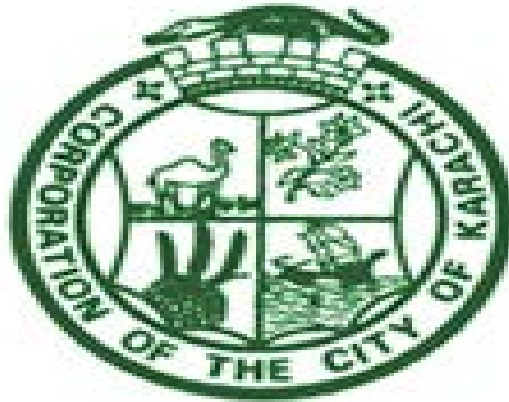
S.NO	S.COD	NAME OF INTERSECTION
1	321	M.A.JINNAH ROAD / MOHD BIN QASIM ROAD (JAMA CLOTH)
2	322	M.A.JINNAH ROAD / BABA-E-URDU ROAD (DMC)
3	323	M.A.JINNAH ROAD/HASSAN ALI AFFANDI RD / DR.ZIAUDDIN AHMED RD (LIGHT HOUSE)
4	324	M.A.JINNAH ROAD / ALTAF HUSSAIN ROAD (DENSO HALL-A)
5	324	M.A.JINNAH ROAD / TAHIR SAIFUDDIN ROAD (DENSO HALL-B)
6	332	SHAHRAE-E-LIAQUAT / MUHAMMAD BIN QASIM ROAD (FRESCO CHOWK)
7	333	SHAHRAE-E-LIAQUAT / DR.ZIAUDDIN ROAD (ARAM BAGH - A)
8	333	SHAHRAE-E-LIAQUAT / BABA-E-URDU ROAD (ARAM BAGH -B)
9	334	SHAHRAE-E-LIAQUAT / TAYYAB JI ROAD (PAPER MARKET)
10	335	SHAHRAE-E-LIAQUAT / ALTAF HUSSAIN HALI ROAD (NEW CHALLI)
11	342	M.BIN QASIM ROAD / STRACHAN ROAD (OLD NED CAMPUS)
12	351	I.I.CHUNDRIGAR ROAD / M.R.KIYANI RD / DR.ZIAUDDIN ROAD (SHAHEEN COMPLEX)
13	411	SULTAN AGHA KHAN ROAD / KIYANI SHAHEED ROAD (MAKKI MASJID)
14	413	M.A.JINNAH ROAD / MANSFIELD STREET (CAPRI)
15	414	M.A.JINNAH ROAD / DAWOOD POTA ROAD (SEVEN DAY)
16	415	M.A.JINNAH ROAD / AGHA KHAN ROAD (KANDA WALLA)
17	416	M.A.JINNAH ROAD / HAKIM FATEH MOHD SEHWANI ROAD (TIBET CENTRE)
18	417	M.A.JINNAH ROAD / JAMILA STREET (SAEED MANZIL)
19	421	SAGHIR SHAHEED ROAD / MANSFIELD STREET (SHALAMAR CHOWK)
20	422	SAGHIR SHAHEED ROAD / DAWOOD POTA ROAD (GRAMMER SCHOOL)
21	423	SULTAN AGHA KHAN ROAD / CASTLE STREET (BAMBINO STAR CINEMA)
22	424	PREEDY STREET / TEMPLE ROADP (REEDY POLICE STATION)
23	431	PREEDY STREET / DAWOOD POTA ROAD (EMPRESS MARKET)
24	432	PREEDY STREET / ZAIBUN-NISA-STREET (SINGER)
25	433	ABDULLAH HAROON ROAD / PREEDY STREET (REGAL CHOWK)
26	434	SHAHRAE-E-LIAQUAT / SIR GHULAM HUSSAIN HIDAYAT ULLAH ROAD (

		AKBER ROAD)
27	435	SHAHRAE-E-LIAQUAT / COURT ROAD
28	441	SHAHRA-E-IRAQ / MANSFILD STREET (CIA CENTRE)
29	442	SHAHRAH-E-IRAQ / MIR KARAM ALI TALPUR ROAD (CHILTON HOTEL)
30	443	SHAHRA-E-IRAQ / DR.DAWOOD POTA ROAD (HONG KONG SHOPPING MALL)
31	444	RAJA GHAZANFAR ALI KHAN ROAD / SHAHRAH-E-IRAQ (BHORI BAZAR)
32	445	SHAHRA-E-IRAQ / ZAIBUNNISA STREET (RUBY JEWELERS)
33	446	ABDULLAH HAROON ROAD / SHAHRA-E-IRAQ (PARADISE)
34	451	RAFIQUE SHAHEED RD/MANSFILD STREET/MIR KARAM ALI TALPUR RD (LUCKY STAR)
35	452	SARWAR SHAHEED ROAD / DR.DAWOOD POTA ROAD (CAFÉ SUBHANI)
36	453	SARWAR SHAHEED ROAD / RAJA GHAZANFAR ALI ROAD (HOTEL SARAWAN)
37	454	ZAIB-UN-NISA STREET / SARWAR SHAHEED ROAD (ZAFAR MARBLE)
38	455	ABDULLAH HAROON ROAD / SARWAR SHAHEED ROAD (ZAINUB MARKET)
39		MUMTAZ HASSAN ROAD / I I CHUNDRIGAR ROAD
40		TALPUR ROAD/ I I CHUNDRIGAR ROAD
41		HABIB BANK/ I I CHUNDRIGAR ROAD
42		ALTAF HUSSAIN ROAD / I I CHUNDRIGAR ROAD
43		M.A.JINNAH ROAD / I.I.CHUNDRIGAR ROAD (TOWER)
44		MAINSFIELD STREET / PREEDY STREET EXTENSION (SADDAR DAWAKHANA)
45	461	SHAHRA-E-FAISAL / RAFIQUE SHAHEED ROAD (TAJ MEHAL HOTEL)
46	463	SHAHRA-E-FAISAL / FATIMA JINNAH ROAD (AVARI TOWERS)
47	464	ABDULLAH HAROON ROAD / CLUB ROAD (HOTEL METROPOLE)
48	511	DR. ZIAUDDIN AHMED ROAD / M.T.KHAN ROAD / CLUB ROAD (PIDC)
49	521	HOSHANG ROAD/ ABDULLAH HAROON ROAD
50		KHAYABAN-E-JAMI / KHAYABAN-E-SADI (BOAT BASIN CLIFTON)
51		KHAYABAN-E-JAMI (AGHA KHAN JAMAT KHANA CLIFTON)
52		KHAYABAN-E-IQBAL / CHARTERED ACCOUNTANTS AVENUE (THREE SWORDS)
53		CH.KHALIQ-UZ-ZAMAN ROAD / CHARTERED ACCOUNTANTS AVENUE (RACE COURSE)

54		CH. KHALIQ UZZAM / LILLY BRIDGE ROAD
55		LILLY ROAD / CANT STATION ROAD
56		HOSHANG ROAD / ZIAUDDIN AHMED ROAD
57		KORANGI ROAD / CHANESAR ROAD (CHAND BI BI / KALA PUL)
58		ZIAUDDIN AHMED ROAD (INFRONT OF C M HOUSE)

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3	Routine maintenance of Sollar Flasher at various locations as per terms & conditions and scope of maintenance attached and as instructions and direction of the Engineer In charge.	60 sites for 12 months		month/site	
	SUB TOTAL				
4	CHARGEABLE MAINTENANCE OF SIGNALS				
4-A	SUPPLY AND REPLACEMENT OF PARTS.				
4-B	INSTALLATION / DISMANTLING CHARGES OF PARTS.				
4-A	SUPPLY AND REPLACEMENT OF PARTS.				
	<u>PARTS OF T-400 CONTROLLER</u>				

1	CONTROLLER BASE	2		Each	
2	MAIN PROCESSOR CARD	1		Each	
3	4-PHASE DRIVER CARD	6		Each	
4	POWER SUPPLY UNIT	6		Each	
5	H.R.C.FUSE	1		Each	
6	CAPACITOR	1		Each	
7	CLOCK MODULE	2		Each	
8	BATTERY	3		Each	
	<u>PARTS OF ST-800 CONTROLLER</u>				
8	POWER SUPPLY UNIT	12		Each	
9	C P U	1		Each	
10	8-PHASE DRIVER CARD	6		Each	
	<u>PARTS OF SIMATIC OR EQUVILENT CONTROLLER</u>				
11	SIMATIC OR EQUVILENT CONTROLLER	2		Each	
12	CENTRAL PROCESSING CARD	1		Each	
13	POWER SUPPLY	4		Each	
14	RELAY OUT PUT CARD	12		Each	
15	ELECTRIC FLASHER	5		Each	
16	CONTROLLER CASING	1		Each	

17	BACKUP BATTERY	5		Each	
	<u>SIGNAL HEADS POLY CARBONIZED</u>				
18	3-WAY ASPECT 200 MM	1		Each	
19	3-WAY ASPECT 200 MM (WITH LED BALL)	24		Each	
20	3-WAY ASPECT 300 MM	1		Each	
21	3-WAY ASPECT 300 MM (WITH LED BALL)	10		Each	
22	2-WAY ASPECT 200 MM	1		Each	
23	2-WAY ASPECT 200 MM (WITH LED BALL)	3		Each	
24	1-WAY ASPECT 300 MM	1		Each	
25	1-WAY ASPECT 300 MM (WITH LED BALL)	1		Each	
26	1-WAY ASPECT 200 MM	35		Each	
27	1-WAY ASPECT 200 MM (WITH LED BALL)	12		Each	
28	PEDESTRIAN PUSH BUTTON	1		Each	
	-				
	<u>PARTS OF 200 MM SIGNAL HEADS</u>				
29	GLASS	35		Each	
30	HOOD	35		Each	
31	RUBBER GASKIT	1		Each	
32	REFLECTOR	1		Each	

33	MOUNTING BRACKET	5		Each	
34	ARROW BRACKET	5		Each	
35	ARROW MASK	1		Each	
36	LED BALLS 200 MM	100		Each	
	<u>PARTS OF 300 MM SIGNAL HEADS</u>				
37	GLASS	5		Each	
38	HOOD	5		Each	
39	RUBBER GASKIT	3		Each	
40	REFLECTOR	2		Each	
41	ARROW BRACKET	2		Each	
42	HANGING BRACKET	2		Each	
43	ARROW MASK	2		Each	
44	LED BALLS 300 MM	30		Each	
45	STANDARD POLE AS PER EXISTING SAMPLE	1		Each	
46	CONSTRUCTION OF FOUNDATION FOR STANDARD POLE (COMPLETE) AS PER SPECS.	12		Each	
47	MAST ARM POLE AS PER EXISTING SAMPLE	1		Each	
48	CONSTRUCTION OF FOUNDATION FOR MAST ARM POLE (COMPLETE) AS PER SPECS.	6			

49	SUPPLY & LAYING OF 1 NO GI PIPE (H.D) 4" DIA IN DUCT UNDER THE ROAD CARRIAGE WAY / FOOTWAY I/C COST OF CONSTRUCTION OF DUCT AND MAKING GOOD THE ROAD COMPLETE AS PER DIRECTION OF THE ENGINEER INCHARGE.	10		METER	
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51	CABLE 12 CORE ARMoured PVC/PVC COPPER CONDUCTOR	850		METER	
52	KESC BOX (BREAKER30.A, INDICATION LAMP, VOLT METER)	12		Each	
53	POWER CABLE 3 CORE 6MM	280		METER	
54	AUTOCHANGEOVER SWITCH (COMPLETE)	1		Each	
55	CIRCUIT BREAKER 30 A	5		Each	
56	CONTACTOR	1		Each	
57	TIMER	1		Each	
58	RECONSTRUCTION OF OLD CHAMBER	10		Each	
59	REPAIR OF OLD CHAMBER	10		Each	
60	PROVIDING & FIXING OF CHAMBER COVER	12		Each	
61	DUCT WITH (PVC) PIPE 2" DIA	70		METER	
62	REPAIR OF STANDARD POLE	2		Each	

63	REPAIR OF MAST ARM POLE	1		Each	
64	POLE COVER FOR MAST ARM POLE	24		Each	
65	POLE COVER FOR STANDARD POLE	35		Each	
66	REPAIR OF MAST ARM POLE FOUNDATION	2		Each	
67	REPAIR OF STANDARD POLE FOUNDATION	2		Each	
68	REPAIR OF POWER SUPPLY ST-800 AND T-400 CONTROLLER	24		Each	
69	FRONT DOOR OF CONTROLLER CASING T-400, ST-800	2		Each	
70	BACK DOOR OF CONTROLLER CASING T-400, ST-800	1		Each	
71	REPAIR OF CONTROLLER CASING T-400, ST-800	2		Each	
72	WIRE 7/ 36	50		METER	
73	WIRE 12 CORE PVC / PVC COPPER CONDUCTOR	50		METER	
74	COUNT DOWN TIMER COMPLETE 12"	24		Each	
75	POWER SUPPLY UNIT FOR LED BALL	35		Each	
76	SOLLAR FLASHER IN 200 MM LIGHT ASPECT	1		Each	
77	UPS 1000 WATT SIGN WAVES	1		Each	
78	DRY BATTERY 100 AMP MAINTENANCE FREE	2		Each	
79	DRY BATTERY 12 AMP MAINTENANCE FREE	30			
80	SOLLAR PANNEL 10 WATT	30			
81	GI PIPE 4 INCH DIA 10 FEET HIGH WITH FOUNDATION	20			
	SUB-TOTAL				

4-B	INSTALLATION / DISMANTLING CHARGES OF PARTS.				
1	T-400 OR ST-800 CONTROLLER 16 PHASE INCLUDING COMMISSIONING & TESTING WITH RE- BLOWING OF EPROM.	3		Each	
2	T-400 OR ST-800 CONTROLLER 8 PHASE INCLUDING COMMISSIONING & TESTING WITH RE- BLOWING OF EPROM.	3		EACH	
3	SIMATIC OR EQUVILENT CONTROLLER INCLUDING COMMISSIONING & TESTING	1		Each	
4	MAIN PROCESSOR CARD	1		Each	
5	4 OR 8 PHASE DRIVER CARD	1		Each	
6	POWER SUPPLY UNIT	1		Each	
7	HRC FUSE	10		Each	
8	CAPACITOR	10		Each	
9	BATTERY T-400	10			
	<u>SIGNAL HEADS POLY CARBONIZED</u>				
10	3-WAY ASPECT 200 MM	20		Each	
11	3-WAY ASPECT 300 MM	10		Each	
12	2-WAY ASPECT 200 MM	10		Each	

13	1-WAY ASPECT 300 MM	5		Each	
14	1-WAY ASPECT 200 MM	5		Each	
15	PEDESTRIAN PUSH BUTTON	5		Each	
	<u>PARTS OF 200 MM SIGNAL HEADS</u>				
16	GLASS	5		Each	
17	HOOD	5		Each	
18	RUBBER GGASKIT	10		Each	
19	REFLECTOR	10		Each	
20	MOUNTING BRACKET	5		Each	
21	ARROW BRACKET	5		Each	
22	ARROW MASK	5		Each	
	<u>PARTS OF 300 MM SIGNAL HEADS</u>				
23	GLASS	20		Each	
24	HOOD	20		Each	
25	RUBBER GASKIT	5		Each	
26	REFLECTOR	5		Each	
27	ARROW BRACKET	5		Each	
28	HANGING BRACKET	1		Each	
29	ARROW MASK	5		Each	

	<u>OTHER PARTS</u>				
30	STANDARD POLE AS PER EXISTING SAMPLE	20		Each	
31	MAST ARM POLE AS PER EXISTING SAMPLE	10		Each	
32	LAYING OF CABLE 12 CORE	500		METER	
	SUB TOTAL				
	ROUTINE MAINTENANCE				
	CHARGEABLE MAINTENANCE				
	TOTAL				

DETAIL OF WORK

NAME OF PROJECT

INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING TRAFFIC SIGNALS IN KARACHI (ZONE-II)

SUMMARY / SCOPE OF WORK:

KMC intend to Improvement / Installation and Up-gradation of existing signals including routine checkup of system and make in functional condition. The traffic signal of Karachi at the various locations as per detail analysis of required and traffic demand. The scheme has been approved by the competent authority. The signals are already in operation at various locations of the city controlled by KMC. The list is attached for ready reference.

ESTIMATED COST OF THE SUBJECT WORK RS. 13864260/=

SORCE OF FUNDING:

KMC Budget / District Annual Development Program

AMOUNT & TYPE OF FINANCING:

KMC Budget / District Annual Development Program

METHOD OF PROCUREMENT USED

SINGLE STAGE – ONE ENVELOPE PROCEDURE (RULE 46 (1) OF SPP RULE 2010)

46 (2) SINGLE STAGE – ONE ENVELOPE PROCEDURE

- a) Notice Inviting Tender and bidding documents of this method shall contain the following eligibility criteria:

The following works from Firm / Contractors Registered with P.E.C in C-5 Category and having valid/renewed license of PEC.

Valid NTN and paid up original challan of professional Tax prescribed fee.

The bidders shall provide evidence to the satisfaction of employer of their eligibility and their capability and adequacy of resources to carryout the contract effectively.

Tenders will be issued to those firms/contractors who provide proof & Experience Certificate from the concerned department of at least 4 years for the maintenance work on Siemens T-400/ST-800 controllers and firm also have the experience to install demand response system in current installed T-400, ST-800 Siemens traffic controller .

The Firm/Contractor must have sufficient experience in execution, running, repairing and maintenance of traffic light signals equipments of an Urban Traffic Control System Specially in Siemens T-400 and ST-800 Controllers.

The Firm /Contractor must have work shop laboratory duly equipped with necessary tools and software required for reconfiguration of controller, repairs of phase driver card, power supply and central processing unit for Siemens T-400 and ST-800 Controllers.

The Firm / Contractor have must sufficient inventory / procurement arrangement of Genuine Spare Parts of Traffic Signal equipment.

- b) All bids received shall be opened and evaluated in the manner prescribed in the Notice Inviting Tender or bidding document.

Minimum Qualification / Eligibility Criteria*

The evidence / documents of the following minimum qualification / eligibility criteria will be checked during opening process of tender & if anyone is missing then the tender will be summarily rejected at the moment by the tender opening committee.

Eligibility:

- Valid PEC in C-5 category along with special category for signalization work EE-06 , EE-07 &CE-10.
- Electrical License of the firm issued from Government of Sindh.
- Valid Professional TAX Certificate.
- Minimum last four years experience in Existing Signaling system with any public sector / organization.
- NTN Certificate

Minimum Qualification Criteria:

- Bid Security, as mentioned in the NIT & Bidding Documents, is furnished.
- All rates quoted including the total amount of the bid shall be in figures & words (both).
- All corrections / overwriting shall be clearly re-written with initials & duly stamped by the bidder.
- The bid shall be properly signed, named & stamped by the authorized person of the firm and authorization letter for signatory shall be enclosed with the tender by the authorized person, if other than the signatory of the firm.
- Evidence of employing Engineer as declared in the PEC License should be provided in shape of copy of Engineer's Registration certificate by PEC.
- Bank certificate of firm.
- The minimum work experience with satisfactory completion report in last 3 years in Maintenance/Installation of traffic signals in scoot system.

**APPENDIX “A”
LIST OF INTERSECTION
NAME**

**LIST OF TRAFFIC SIGNALS UNDER TRANSPORT & COMMUNICATION DEPARTMENT SOUTH
(ZONE-II)**

S.NO	S.COD	NAME OF INTERSECTION
1		SHER SHAH SORI ROAD / NAWAB SIDDIQUE ALI KHAN RD / DILAWAR FIGAR ROAD (BOARD OFFICE)
2		NISHTAR ROAD / DEEPCHAND OJHA ROAD (LASBELLA)
3		NISHTAR ROAD / BRITTO ROAD (AL-BELLA)
4		BARA BOARD / MANGO PIR ROAD
5		NISHTAR ROAD / GARDEN ROAD (LOVE LANE)
6		SHER SHAH SORI ROAD / SHARAH-E-JAHANGIR (FIVE STAR CHOWRANGI)
7		SHAHRA-E-PAKISTAN / SHARAH-E-HAMAYUN (KARIMABAD)
8		JAHANGIR ROAD / CLAYTON ROAD / M.A.JINNAH ROAD / DEEPCHAND OJHA ROAD (GRUMANDIR)
9		JAMSHED ROAD / MUFTI AHMED UR REHMAN ROAD (BANORIA CHOWK)
10		CLAYTON ROAD / BRITTO ROAD (SOLDIER BAZAR)
11		M.A.JINNAH ROAD / SHAHRAH-E-QUAIDEEN / BRITTO ROAD (OLD EXHIBITION)
12		ALLAMA SHABBIR AHMED USMANI ROAD / ABUL HASSAN ISPHANI ROAD (MASKAN CHOWRANGI)
13		TARIQ ROAD / ALLAMA IQBAL ROAD (CAFÉ LIBERTY)
14		SHAHRA-E-QUAIDEEN / TARIQ ROAD (ALLAH WALLI CHOWRANGI)
15		ABUL HASSAN ISPHANI ROAD / MOULANA YOUSUF LUDHIANWI ROAD (PARADISE BAKERY)
16		ALLAMA SHABBIR AHMED USMANI ROAD / OLYMPIAN ISLAHUDDIN ROAD (DISCO BAKERY)
17		13-D RAILWAY CROSSING / SAHBA AKHTAR ROAD
18		ALAMGIR ROAD / JAMAL UDDIN AFGHANI ROAD (SHARFABAD)
19		SHAHRA-E-QUAIDEEN / KHALID BIN WALID ROAD (NOORANI KABAB)
20		SAHBA AKHTAR ROAD / SHAHRAH-E-JAHNGIR (YASEENABAD)
21		SAHBA AKHTAR ROAD / SARDAR ALI SABRI ROAD (RUB HOSPITAL)
22		SIRSYED ROAD / KHALID BIN WALEED ROAD
23		ALAMA IQBAL ROAD / KHALID BIN WALEED ROAD

24		SHAHEED MILAT ROAD / KHALID BIN WALID ROAD (MEDICARE)
25		SAHBA AKHTAR ROAD / SHAHRAH-E- AL QUDS (MOUCHI MOUR)
26		SHAHEED MILAT ROAD / TARIQ ROAD (M.CHOWRANGI)
27		RAZI ROAD / PECHS
28		ESTATE AVENUE / CENTRAL AVENUE / SHAHRAH-E-MEHDI HASSAN (GHANI CHOWRANGI)
29		SHAHRA-E-QUAIDEEN / KASHMIR ROAD (SOCITY OFFICE CWORANGI)
30		KORANGI SHAH FAISAL ROAD / AZEEM PURA ROAD (SHAMA SHOPPING SH.FAISAL COLONY)
31		KORANGI SHAH FAISAL ROAD (ABBAS BA WAZEER SH.FAISAL COLONY)
32	720	SHAREA FAISAL / RASHID MINHAS ROAD (DRIG ROAD)
33	721	SHAHRA-E-FAISAL / MILITARY GATE
34	722	SHAHRA-E-FAISAL / STAR GATE ROAD
35		RASHID MINHAS ROAD / ARMY PUBLIC SCHOOL
36		JOHAR CHOWRANGI ROAD / ABUL ASAR HAFEEZ JALHANDRI ROAD
37		NATIONAL STADIUM ROAD / PIR SIBGHATULLAH ROAD / KARSAZ ROAD
38		H.I.R ROAD / NAVY GATE
39		NATIONAL STADIUM ROAD / PIR SIBGHATULLAH ROAD (AGHA KHAN HOSPITAL)
40		SHAHEED-E-MILLAT ROAD / SIRAJ -UD-DAULA ROAD
41		SHAHEED-E-MILLAT ROAD / TIPU SULTAN ROAD
42		KORANGI CROSSING / 12000 ROAD
43		KORANGI NO-5 / 12000 ROAD
44		KORANGI NO-2 1/2 / 12000 ROAD
45		ESTATE AVENUE / ABDULLAH AHMED ROAD (SHERSHAH)
46		JINNAH AVENUE / LIAQUAT ALI KHAN ROAD (ALPINE)
47		MALIR LINK ROAD TO S.HIGHWAY / JINNAH AVENUE (TANK CHOWRANGI)
48	725	NATIONAL HIGHWAY / BEGUM KHURSHEED ROAD (KALA BOARD)

VOLUME-I

KARACHI METROPOLITON CORPORATION

TRANSPORT & COMMUNICATION DEPARTMENT

TENDER DOCUMENTS

SINGLE STAGE – ONE ENVELOPE SYSTEM

BASED ON SPPRA RULE 2010



INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING TRAFFIC

SIGNALS IN KARACHI (ZONE-I)

VALIDITY OF TENDER: 90 DAYS

TENDER COST: Rs. 3,000/-

TO BE OPENED ON: 26TH AUGUST 2015

**DIRECTOR (TC&O)
T&C DEPARTMENT, KMC**

No.

DATED: _____

ISSUE TO M/S _____

P.O. NO: _____

DATED: _____

BANK: _____

Signature & Stamp of Issuing Authority

1. INTRODUCTION & BACKGROUND

- 1- TCD KMC is controlling / regulating the traffic throughout signalized UTC and NON-UTC system in all over Karachi 106 nose of traffic signal since 1998 on every year annual contract is invited has being awarded to the firm eligible. For monitoring the system and keep its operating system 24/7 round the clock throughout the year. The list of intersection being mention and operation is annexure A.
- 2- Presently the system is in operative condition and being maintained by The TCD Department through the contractor / firm.
- 3- The TOR as under.

2. THE REQUEST FOR PROPOSALS (RFP)

- 1- This request for proposal RFP is issued by transport & communication department on the behalf of the Karachi Metropolitan Corporation. It invites well reputed firm having experience in the field of traffic signalization, operation & maintenance.

3. RESPONSIBILITIES OF THE CONTRACTOR

Maintenance Requirements for Contractor

The maintenance requirements of the Urban Traffic Control System works fall into following two categories:

- Routine Maintenance of Traffic Signal Equipment and Controllers.
- Fault Call Out Maintenance

1.1 Routine Maintenance

Daily

Visit of all signal sites and replacement of fused lamps if any and submission of status of complaint / repair.

Fault Call out Maintenance

Monthly

1. Cleaning of Signal Heads and Signal Poles

2. Checking/ Calibration of clock of each controller with master controller

Half Yearly

Repainting of Signal Poles

Controller Functional Checks

Visual Inspection of Controller, Cable Termination

4. BASIS FOR SELECTION OF CONTRACTOR / FIRM

- The Contractor/firm will be selected through competitive tendering process in accordance with the Sindh Public Procurement Rules 2010 and as per the two levels evaluation criteria specified below:

Level – 1 Technical Evaluation primarily concerning experience in signalization of intersection especially T-400 and ST-800 Traffic controlling system, Maintenance of traffic signals and financial standing of the firm.

Level – 2 Financial Evaluation, basically comparison of Financial Bids.

5. THE PROJECT TERMS:

The initial term will be one (01) year, renewable for another term subject to performance evaluation and as per mutual consent of the parties, OR the project will be re-tendered accordingly.

6. THE RFP PACKAGE:

The services to be provided by the bidders, the procedures to be followed during the tendering process, and the terms and conditions of the draft Agreement are described in this RFP Package. The RFP Package consists of:

The RFP

Annexure H to the RFP – Bidder's Commitment Letter

7. PROJECT MONITORING:

The process will be conducted solely under the direction and supervision of the Senior Director, T&C Department, KMC.

8. TIME TABLE:

The time for submission of proposals by the bidders is 25TH August, 2015 up to 02:30 PM. The proposal shall be opened on the same day at 03:00 PM.

9. PROPOSAL FORMAT AND CONTENT:

Contents of the Proposal

Each proposal shall consist of the Bidder's Commitment Letter (Annex 'J' to this RFP), together with the following.

Technical Proposal containing the following information:

- (i) Confirmation of conformance with all mandatory tender requirements and a description of the corporate structure of the bidding entity and its relation with companies and individuals associated with the proposal;
- (ii) Evidence relating to financial capability to provide the services, including audited financial statements for the most recent three years for the bidding entity and/or consortium members and/ or parent company(i.es) as appropriate details of any encumbrances, contingent liabilities, and/or outstanding claims that may materially affect the financial position of the bidding entity.
- (iii) The earnest money of 2% of offer rates shall be deposited by the bidder along with the bid in the form of pay order/ bank draft in the name of Transport & Communication Department, KMC, with the Financial Proposal.

Financial Proposal containing the following information:

The financial proposal shall comprise of the bid form attached with the RFP.

10. COST OF PROPOSALS:

The bidder shall bear all costs and expenses with respect to the preparation and submission of its proposal and its participation in the tendering process.

11. PERIOD OF VALIDITY OF THE PROPOSAL:

Proposals shall remain valid for a period of 90 days commencing at the Submission Deadline as established by RFP or as amended pursuant to RFP.

The KMC may solicit bidders' consent to an extension of the Proposal Validity Period Up to 120 days.

12. MODIFICATION OF PROPOSALS:

Bidders cannot modify proposal after submission.

13. WITHDRAWAL OF PROPOSALS:

A bidder may withdraw its proposal after submission provided that a Notice of Withdrawal is received by the KMC prior to the Submission Deadline.

14. SUBMISSION, RECEIPT AND SIGNING OF PROPOSALS:

The bidder shall the proposal under two envelopes systems, that is, the technical and financial proposals is separate envelopes clearly marked technical and financial with original and one duplicate copy at the following address:

Senior Director,
Transport & Communication Department, KMC,
8th Floor, Civic Centre, Gulshan-e-Iqbal, Karachi.
Tel: 021-99230655 – Fax: 021-99231787.

15. OPENING AND EVALUATION OF PROPOSALS:

Opening of Technical Proposals:

The proposal submitted on or before the Submission, Deadline, will be opened on the same day at 03:00 PM, in the presence of the bidders' representatives who choose to attend the opening.

16. Only the names of bidders shall be announced who submitted the proposals.

17. Bidders' representatives who attend the opening of the envelopes shall sign a register to record their attendance.

18. OPENING OF FINANCIAL PROPOSALS:

The financial proposals of only Qualified Bidders will be opened on the notified date and time.

19. EVALUATION OF PROPOSALS:

The Evaluation of Proposals shall be undertaken by the designated Evaluation Committee after the deadline for submission of proposals. Any proposal not in conformity with the prescribed bidding procedure and requirements in the RFP will be disqualified.

The Technical proposals shall be evaluated first in accordance with the evaluated criteria prescribed below. The bidders who will secure 70 points shall be considered technically qualified. The financial proposals of the technically qualified bidders shall be opened in the presence of bidders. The Evaluation Report shall be hoisted on KMC website and that of the prior to the award of contract.

TECHNICAL EVALUATION CRITERIA:

The Technical Proposal shall be evaluated as per the following criteria:

S.NO	CRITERIA	DISTRIBUTION	MAXIMUM
1	<p><u>Qualification / Experience of firm</u></p> <p>A. Experience in maintenance of traffic Signals T-400 and ST-800 Controllers (Attached documentary evidence)</p> <p>1. For Last 3 years experience 05 2. For Last 5 years experience 15</p> <p>B. Experience in installation of traffic signals (Attached documentary evidence) List of related project complete</p> <p>1. Signal related project completed in last 3 years 05 2. Signal related project completed in last 5 years 10</p>		20
2	<p><u>License</u></p> <p>1. PEC license in relevant category EE-06 ,EE- 07 & CE-10 (Attached documentary evidence) 15 2. Electrical License 05</p>		20
3	<p><u>Support For Improvement/Installation/Repair</u></p> <p>1. Sufficient inventory of Genuine spare parts of traffic signals (Specially T-400 & ST-800 Controllers & German & Turkish lights) (Attached documentary evidence). 15</p> <p>2. Principle letter for support of equipment of traffic signal equipment. 05</p> <p>3. Laboratory duly equipped with necessary tools and software rand repaired of phase driver card and mother board.,(with documentary evidence) 15</p>		35
4	<p><u>Engineer depute in maintenance of traffic signal.</u></p> <p>1. Electrical engineer (Attached Valid PEC Registration certificate / Card. 05 2. Electronic engineer (Attached Valid PEC Registration certificate / Card. 05</p>		10

METHOD OF PROCUREMENT USED

SINGLE STAGE – ONE ENVELOPE PROCEDURE (RULE 46 (1) OF SPP RULE 2010)

46 (2) SINGLE STAGE –ONE ENVELOPE PROCEDURE

- a) Notice Inviting Tender and bidding documents of this method shall contain the following eligibility criteria:

The following works from Firm / Contractors Registered with P.E.C in C-5 Category with special category for signalization work EE-06, EE-07 & CE-10 and having Valid/renewed license of PEC.

Valid Electrical License of the Firm issued from Government of Sindh.

Valid NTN and paid up original challan of professional Tax prescribed fee.

The bidders shall provide evidence to the satisfaction of employer of their eligibility and their capability and adequacy of resources to carry out the contract effectively.

Tenders will be issued to those firms/contractors who provide letter from principal / original equipment manufacturer for promising of technical and equipment supply support.

The Firm/Contractor minimum last four years experience in relevant field with any public sector / organization.

The Firm /Contractor must have laboratory duly equipped with necessary tools and software for repair, configuration and re-configuration of the controller.

The Firm / Contractor have must sufficient inventory / procurement arrangement of Genuine Spare Parts, (attached documentary evidence).

- b) All bids received shall be opened and evaluated in the manner prescribed in the Notice Inviting Tender or bidding document.

Minimum Qualification / Eligibility Criteria*

The evidence / documents of the following minimum qualification / eligibility criteria will be checked during opening process of tender & if anyone is missing then the tender will be summarily rejected at the moment by the tender opening committee.

Eligibility:

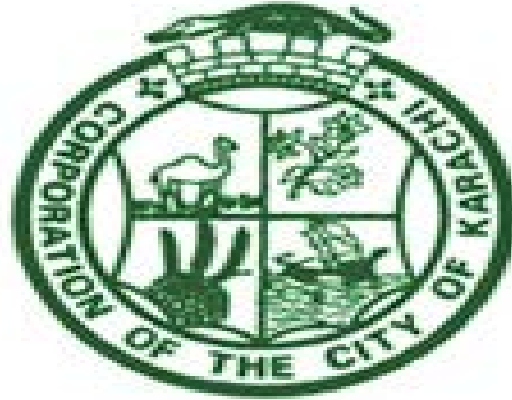
- Valid PEC in C-5 category along with special category for signalization work EE-06, EE-07 & CE-10.
- Electrical License of the firm issued from Government of Sindh.
- Valid Professional TAX Certificate.
- Minimum last four years experience in Existing Signaling system with any public sector / organization.
- NTN Certificate

Minimum Qualification Criteria:

- Bid Security, as mentioned in the NIT & Bidding Documents, is furnished.
- All rates quoted including the total amount of the bid shall be in figures & words (both).
- All corrections / overwriting shall be clearly re-written with initials & duly stamped by the bidder.
- The bid shall be properly signed, named & stamped by the authorized person of the firm and authorization letter for signatory shall be enclosed with the tender by the authorized person, if other than the signatory of the firm.
- Evidence of employing Engineer as declared in the PEC License should be provided in shape of copy of Engineer's Registration certificate by PEC.
- Bank certificate of firm.
- The minimum work experience with satisfactory completion report in last 4 years in Maintenance/Installation of traffic signals.

KARACHI METROPOLITAN CORPORATION

TRANSPORT & COMMUNICATION DEPARTMENT



TERMS OF REFERENCE (TOR)

FOR

**INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING
TRAFFIC SIGNALS IN KARACHI (ZONE-I)**

1. Introduction

This document describes the System to meet the maintenance requirements for traffic signals in Karachi. During one year maintenance period.

2. Brief Maintenance Requirements

The maintenance requirements of the Urban Traffic Control System works fall into following two categories:

- Routine Maintenance of Traffic Signal Equipment and Controllers.
- Fault Call Out Maintenance

2.1 Routine Maintenance

Daily

Visit of All signal sites and replacement of fined lamps if any and submission of status of complaint/repair:

Fault Call out Maintenance

Monthly

1. Cleaning of Signal Heads and Signal Poles
2. Checking/calibration of clock of each controller with master controller.

Half Yearly

Repainting of Signal Poles
Controller Functional Checks
Visual Inspection of Controller, Cable Termination

2.2 Fault Categories:

- Urgent

And

- Less urgent faults. Urgent faults are

Urgent faults are

- All aspects of one phase or more units.
- 50% of the red lamps on one phase unlit.
- Signals failing to change

- Defective signals/timings causing abnormal traffic conditions.
- Signals damaged and/or in a dangerous condition

2.3. Response Time

Urgent Faults

Within 1 hour on working day	if no other fault exists
Within 4 hours on working day	if any other fault exists
Within 4 hours on weekends and Holidays.	if no other fault exists
Within 6 hours on weekends and Holidays.	if any other fault exists.

Less urgent faults

To be responded to	within 10 contract hours
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2.4. Definition of Response

Attending the location of the fault within the periods defined above and continuously working during the contract hours to clear the fault.

2.5. Maintenance Working Hours

The working hours for maintenance shall be

0830 -1830	MON through SAT
0930 - 1700	SUN and Public Holidays
0830 -1500	during the Holy Month of Ramzan

Faults reported at times other than between the above working hours shall be deemed to have been reported on the start of next working days subject to clause 2.5 above. At weekends non-urgent faults shall be deemed to be reported two hours prior to the start of the next working day, No routine maintenance will be carried out on Eid days, 10th of Moharam and 14 August, however for emergency person will be available on working telephone to attend on call from TRANSPORT & COMMUNICATION DEPARTMENT

2.6. Maintenance Depot

A location serving as the base for maintenance activities is to be maintained. The complaints pertaining Traffic Signal Faults shall be reported at the Depot at a given 24 hour's Mobile number. Arrangements for receipt of complaints should be maintained on register.

2.7. Spares

All the spares for maintenance shall be specified and kept at the Contractor's depot. A perpetual inventory of spares shall be maintained by the Contractor and inspected by the Engineer at six monthly intervals. All die material and spare parts to be supplied and replaced shall be brand new and compatible with the corresponding part of the existing Traffic Signal Equipment installed at site.

2.8. Non Performance Rebates

One Rebate Unit (RU) =0.05% of the annual routine maintenance cost.

If the Contractor fails to meet the performance requirements regarding response and fault attendance one Rebate Unit for every four hour period in excess of the response times defined limited to a total of 100 RU, can be claimed by the Engineer.

Non performance rebates shall not be applicable if

1. The equipment has to be taken out of service for repairs or
2. It is necessary that the equipment be isolated from the mains supply for which the Engineer fails to provide a competent person or
3. The equipment is damaged and can only be 'made safe'

2.9. Schedule of Equipment to be maintained

The Contractor shall maintain all the street equipments mentioned in clause

3. Meeting the Requirements

3.1 Staffing

Maintenance team shall comprise of following personnel, strength whereof shall be kept according to the job requirements:

System Engineer (Maintenance In charge)

Supervisors

Technicians

Telephone Operator/Co-coordinator

Helpers

This team would be based at the UTC Project Depot and would employ and will be equipped with all required tools to carry out:

Routine maintenance as per specifications

And

Respond to Fault Call Outs.

3.2 Schedule of Equipment and Works to be maintained

The following equipments! Works at the intersections shall be maintained during the 12 months maintenance period

- Traffic Signal Controllers
- Traffic Signal Aspects and assemblies
- Mast arm and Standard Signal poles.
- Accessories to above.

3.3 Spares for Maintenance

The routine maintenance charges include the service to be rendered and cost for bulb replacement etc. and the replacement of spare parts on the stock of TRANSPORT & COMMUNICATION DEPARTMENT A tentative spares shall be arranged by the contractor on chargeable basis.

3.4 Maintenance Depot.

Maintenance Depot shall be equipped to receive fault complaints. The address of the Maintenance Depot and 24 hour Mobile Telephone No. shall be communicated to the Department before the start of the contract.

3.5. Routine Maintenance Services

Following are the broad functions of the maintenance teams to perform maintenance services:

- General Inspection and Fault Reporting
- Replacement of fused lamps
- Cleaning of Signal Heads and Poles
- Clearance of Damaged equipment from the street
- Repainting of signal poles
- Replacement of spare parts on stock of T & C

The System Engineer shall be the overall in charge to perform the maintenance activities shall have following specific tasks:

- Contact the Engineer or any person authorized by the Engineer daily upon commencement of maintenance working hours to inform the schedule of works during the day or Fax the program of the day to the office of the Engineer.
- Overall administrative control of maintenance set-up
- Fine tuning of all the controllers as & when required to activate customize the new time plans generated according to traffic load on the junction.
- Attending Controller faults.
- Making timing changes upon written request of the Engineer.
- Synchronization of CLF Clocks (if required)
- Inspection of controllers
- Document fault reports, damages, spare requirements and monthly progress to tile Engineer.
- Daily report of the status of each complaint attended/fault rectified or otherwise.
- Daily inspection of 60 Traffic signal equipments on all the junctions jointly along with the representative of the Engineer In charge, Transport to be arranged by the contractor.

3.6. Timing changes/modification in staging and specifications

For timing changes/modification in specification etc. the Engineer shall issue instructions to the System Engineer on a form after which the System Engineer shall carry out the job and report back to the Engineer. Reconfiguration/Customization of the controller shall be a chargeable maintenance activity.

3.7. Fault Reporting System

Complaints shall be received at Depot:

By Telephone

By fax,

Or by reporting in person

The complaints shall be registered by the attendant on the log sheet.

During the working hours a complaint Number would be issued to the complaint. During non working hours on holidays complaint would recorded on the answering telephone machine and number would allotted on the next working day.

3.8. Records for the Engineer.

The System Engineer would regularly submit in writing to the Engineer on monthly basis the following:

Log of the complaints received

Detail of routine maintenance carried out

Detail of parts replaced if any

Schedule of routine maintenance shall be provided to the Engineer in advance in the event of damages the System Engineer will notify the Engineer through a Damage Report in quadruplicate and the Engineer will inspect the site with system engineer and will issue necessary instruction for repair/replacement on the same report.

3.9. Sequence of fault removals.

Sequence of events in removal of any fault is shown in the Flow chart.

3.10. Documents related to Maintenance

3.10.1. Daily Fault Log

This record will be kept at the UTC maintenance depot. It will contain the complaint number and location with a brief mention of the nature of complaint, reporting time, time of attendance of fault. This log will form the source document for all other documents related to Fault Call Out.

3.10.2. Yearly Maintenance Record

Master copy of this document to be kept at the Depot. She staff will have a duplicate to keep the maintenance history for each site. It contains the record of bulb replacement; faults and damages occurred during the year.

There will be a unique card for each site and information on this card will be a proof that maintenance is being carried out as per contract conditions.

3.11. Maintenance Charges.

Maintenance charges shall be invoiced on periodic basis to the Executive Engineer at the rate quoted/month by the contractor for routine maintenance which include repair of modules of phase driver cards and motherboard of the controller.

Charges for services outside the- scope of work defined above shall be invoiced separately by the contractor at the rate prevailing at the time of works done.

SPECIAL CONDITIONS

CLAUSE-I

- a) The routine maintenance include the services to be rendered for keeping the Traffic Signal Equipment in perfect running condition etc. Including repainting of poles, repair of modules of phase driver cards, mother boards of controllers, cost of bulb including replacement of spare parts. These spare parts will be kept under lock & key of the authorized representative of T&C however, separate but proper and adequate space will be provided by the contractor within the Maintenance Depot free of charge. Watch & ward of the entire Depot round the clock will be the responsibility of the Contractor. The contractor will also maintain the inventory of spare parts and will fulfill other obligations as set-forth in the TOR.
- b) Chargeable maintenance includes the supply and replacement of spare parts as and when required on the rates given in the offer. However, for all other services and works outside the scope of this agreement if desired by Executive Engineer (E/M) TRAFFIC SIGNAL UNIT TCD KMC the contractor will submit an estimate with rate analysis for the jobs to be carried out before execution and shall charge rates applicable for such jobs after obtaining the necessary approval from Executive Engineer (E/M) TRAFFIC SIGNAL UNIT.

CLAUSE-II

Any reason or cause whatsoever for non-availability of the required parts will not be entertained and the existing system will not be replaced due to this reason. This has to be assured by the contractor before awarding the contract by submitting authorization certificate from manufacturer of system.

CLAUSE-III

The contractor hereby permits the authority to make deductions from any payment to him by the authority for the work done under this contract, such sum, will amount to 10% of all money so paid. Such deductions to be held by the Authority by way of Security Deposit against the completion of work. Security Deposit so deduct shall be refunded within 3 months from the date of completion of work.

CLAUSE-IV

The maintenance of the traffic signal equipment on all junctions shall be carried out properly/promptly with all due diligence to keep all the signal equipment in perfect running condition (Un-interrupted and quality maintenance is the essence of the contract).The maintenance of the signal equipment will be carried out by the team of technician having sufficient experience and knowledge of maintenance of UTC signal equipment headed by qualified Engineer trained for the Controller installed under this project. Maintenance and fault attending in Traffic Controller will be done only in presence of the Qualified/Trained Maintenance Engineer of UTC System. In case of delay in clearance of reported fault beyond the specified time penalty/non-performance rebate, One Rebate Unit (R.U) for every 4 hours delay will be imposed on the contractor; however, the total non-performance rebate will not exceed 100 R.U per annum. One R.U =0.05% of the annual routine maintenance cost.

CLAUSE-V

The maintenance and service of the equipment will be carried out by the maintenance staff of contractor, during normal business hours, however, in emergency cases and, on special request of the Executive Engineer (E/M) of T&C. Contractor will send their maintenance staff even after the official working hours. The T & C shall furnish all information and assistance to the maintenance staff of contractor. For damage caused due to negligence of Contractor's maintenance staff, will be repaired by the Contractor free of charge.

CLAUSE-VI

In the event of any dispute or difference arising between the T & C and contractor in connection with any of the matters contained in this agreement, be settled amicably , if , however both the parties fail to arrive at an amicably settlement, such dispute or difference be referred to the two arbitrators one to be appointed by each party and the provisions of the Pakistan Arbitration Act 1940 or any re-enactment or statutory modification thereof for the time being in force shall be modification to such arbitration proceedings. The decisions of the Arbitration shall be accepted as binding upon both the parties.

CLAUSE-VII

One Hilux Vehicle owned by T.C.D. for maintenance of U.T.C. and NON-UTC system shall be maintained by the Contractor at his own cost. The Contractor will bear the operation & maintenance charges including Motor Vehicle tax & insurance charges etc of the vehicle during the period of contract. He shall return the vehicle to T.C.D. after expiry of contract period in good running condition.

CLAUSE-VIII

The T & C, KMC will pay all such maintenance, replacement or services, arising out due to outside influence such as accidents, violence, riots, strikes, storms, theft and fire.

CLAUSE-IX

- a) All Duties and Taxes (Provincial and Central Governments) will be borne by the contractor. The maintenance charges and the rates of spare parts, replacement charges are firm and no escalation due to fluctuation in market rates will be paid to the contractor during currency of this Contract Agreement.

- b) The Contractor authorizes the "Authority" to deduct Income Tax from all payment made to him, in accordance with the prevailing Income Tax Laws of Pakistan with any amendments made subsequently during the currency of the contract. The Income Tax so deducted will be deposited with the Government of Pakistan towards payment of advance Income Tax by contractor. When such deduction is made from the payments a certificate to the effect shall be issued by the Authority to the Contractor. Not with standing such deductions of advance Income Tax at source, the contractor shall be liable to pay the balance Income Tax, Super Tax and other taxes on income or his profit arising out of this contract and his employees on their remuneration etc. in accordance with the prevailing Income Tax Laws of Pakistan.

CLAUSE-X

The contractor agreement can be terminated by T & C at any time on a 30 thirty days prior notice given to the contractor. No claim whatsoever on this account will be admissible.

APPENDIX “A”

LIST OF

INTERSECTION

I
LIST OF TRAFFIC SIGNALS UNDER TRANSPORT & COMMUNICATION DEPARTMENT SOUTH
(ZONE-I)

S.NO	S.COD	NAME OF INTERSECTION
1	321	M.A.JINNAH ROAD / MOHD BIN QASIM ROAD (JAMA CLOTH)
2	322	M.A.JINNAH ROAD / BABA-E-URDU ROAD (DMC)
3	323	M.A.JINNAH ROAD/HASSAN ALI AFFANDI RD / DR.ZIAUDDIN AHMED RD (LIGHT HOUSE)
4	324	M.A.JINNAH ROAD / ALTAF HUSSAIN ROAD (DENSO HALL-A)
5	324	M.A.JINNAH ROAD / TAHIR SAIFUDDIN ROAD (DENSO HALL-B)
6	332	SHAHRAE-E-LIAQUAT / MUHAMMAD BIN QASIM ROAD (FRESCO CHOWK)
7	333	SHAHRAE-E-LIAQUAT / DR.ZIAUDDIN ROAD (ARAM BAGH - A)
8	333	SHAHRAE-E-LIAQUAT / BABA-E-URDU ROAD (ARAM BAGH -B)
9	334	SHAHRAE-E-LIAQUAT / TAYYAB JI ROAD (PAPER MARKET)
10	335	SHAHRAE-E-LIAQUAT / ALTAF HUSSAIN HALI ROAD (NEW CHALLI)
11	342	M.BIN QASIM ROAD / STRACHAN ROAD (OLD NED CAMPUS)
12	351	I.I.CHUNDRIGAR ROAD / M.R.KIYANI RD / DR.ZIAUDDIN ROAD (SHAHEEN COMPLEX)
13	411	SULTAN AGHA KHAN ROAD / KIYANI SHAHEED ROAD (MAKKI MASJID)
14	413	M.A.JINNAH ROAD / MANSFIELD STREET (CAPRI)
15	414	M.A.JINNAH ROAD / DAWOOD POTA ROAD (SEVEN DAY)
16	415	M.A.JINNAH ROAD / AGHA KHAN ROAD (KANDA WALLA)
17	416	M.A.JINNAH ROAD / HAKIM FATEH MOHD SEHWANI ROAD (TIBET CENTRE)
18	417	M.A.JINNAH ROAD / JAMILA STREET (SAEED MANZIL)
19	421	SAGHIR SHAHEED ROAD / MANSFIELD STREET (SHALAMAR CHOWK)
20	422	SAGHIR SHAHEED ROAD / DAWOOD POTA ROAD (GRAMMER SCHOOL)
21	423	SULTAN AGHA KHAN ROAD / CASTLE STREET (BAMBINO STAR CINEMA)
22	424	PREEDY STREET / TEMPLE ROADP (REEDY POLICE STATION)
23	431	PREEDY STREET / DAWOOD POTA ROAD (EMPRESS MARKET)
24	432	PREEDY STREET / ZAIBUN-NISA-STREET (SINGER)
25	433	ABDULLAH HAROON ROAD / PREEDY STREET (REGAL CHOWK)
26	434	SHAHRAE-E-LIAQUAT / SIR GHULAM HUSSAIN HIDAYAT ULLAH ROAD (AKBER ROAD)
27	435	SHAHRAE-E-LIAQUAT / COURT ROAD
28	441	SHAHRA-E-IRAQ / MANSFILD STREET (CIA CENTRE)
29	442	SHAHRAH-E-IRAQ / MIR KARAM ALI TALPUR ROAD (CHILTON HOTEL)

30	443	SHAHRA-E-IRAQ / DR.DAWOOD POTA ROAD (HONG KONG SHOPPING MALL)
31	444	RAJA GHAZANFAR ALI KHAN ROAD / SHAHRAH-E-IRAQ (BHORI BAZAR)
32	445	SHAHRA-E-IRAQ / ZAIBUNNISA STREET (RUBY JEWELERS)
33	446	ABDULLAH HAROON ROAD / SHAHRA-E-IRAQ (PARADISE)
34	451	RAFIQUE SHAHEED RD/MANSFILD STREET/MIR KARAM ALI TALPUR RD (LUCKY STAR)
35	452	SARWAR SHAHEED ROAD / DR.DAWOOD POTA ROAD (CAFÉ SUBHANI)
36	453	SARWAR SHAHEED ROAD / RAJA GHAZANFAR ALI ROAD (HOTEL SARAWAN)
37	454	ZAIB-UN-NISA STREET / SARWAR SHAHEED ROAD (ZAFAR MARBLE)
38	455	ABDULLAH HAROON ROAD / SARWAR SHAHEED ROAD (ZAINUB MARKET)
39		MUMTAZ HASSAN ROAD / I I CHUNDRIGAR ROAD
40		TALPUR ROAD/ I I CHUNDRIGAR ROAD
41		HABIB BANK/ I I CHUNDRIGAR ROAD
42		ALTAH HUSSAIN ROAD / I I CHUNDRIGAR ROAD
43		M.A.JINNAH ROAD / I.I.CHUNDRIGAR ROAD (TOWER)
44		MAINSFIELD STREET / PREEDY STREET EXTENSION (SADDAR DAWAKHANA)
45	461	SHAHRA-E-FAISAL / RAFIQUE SHAHEED ROAD (TAJ MEHAL HOTEL)
46	463	SHAHRA-E-FAISAL / FATIMA JINNAH ROAD (AVARI TOWERS)
47	464	ABDULLAH HAROON ROAD / CLUB ROAD (HOTEL METROPOLE)
48	511	DR. ZIAUDDIN AHMED ROAD / M.T.KHAN ROAD / CLUB ROAD (PIDC)
49	521	HOSHANG ROAD/ ABDULLAH HAROON ROAD
50		KHAYABAN-E-JAMI / KHAYABAN-E-SADI (BOAT BASIN CLIFTON)
51		KHAYABAN-E-JAMI (AGHA KHAN JAMAT KHANA CLIFTON)
52		KHAYABAN-E-IQBAL / CHARTERED ACCOUNTANTS AVENUE (THREE SWORDS)
53		CH.KHALIQ-UZ-ZAMAN ROAD / CHARTERED ACCOUNTANTS AVENUE (RACE COURSE)
54		CH. KHALIQ UZZAM / LILLY BRIDGE ROAD
55		LILLY ROAD / CANT STATION ROAD
56		HOSHANG ROAD / ZIAUDDIN AHMED ROAD
57		KORANGI ROAD / CHANESAR ROAD (CHAND BI BI / KALA PUL)
58		ZIAUDDIN AHMED ROAD (INFRONT OF C M HOUSE)

APPENDIX “B”

UTC STORE

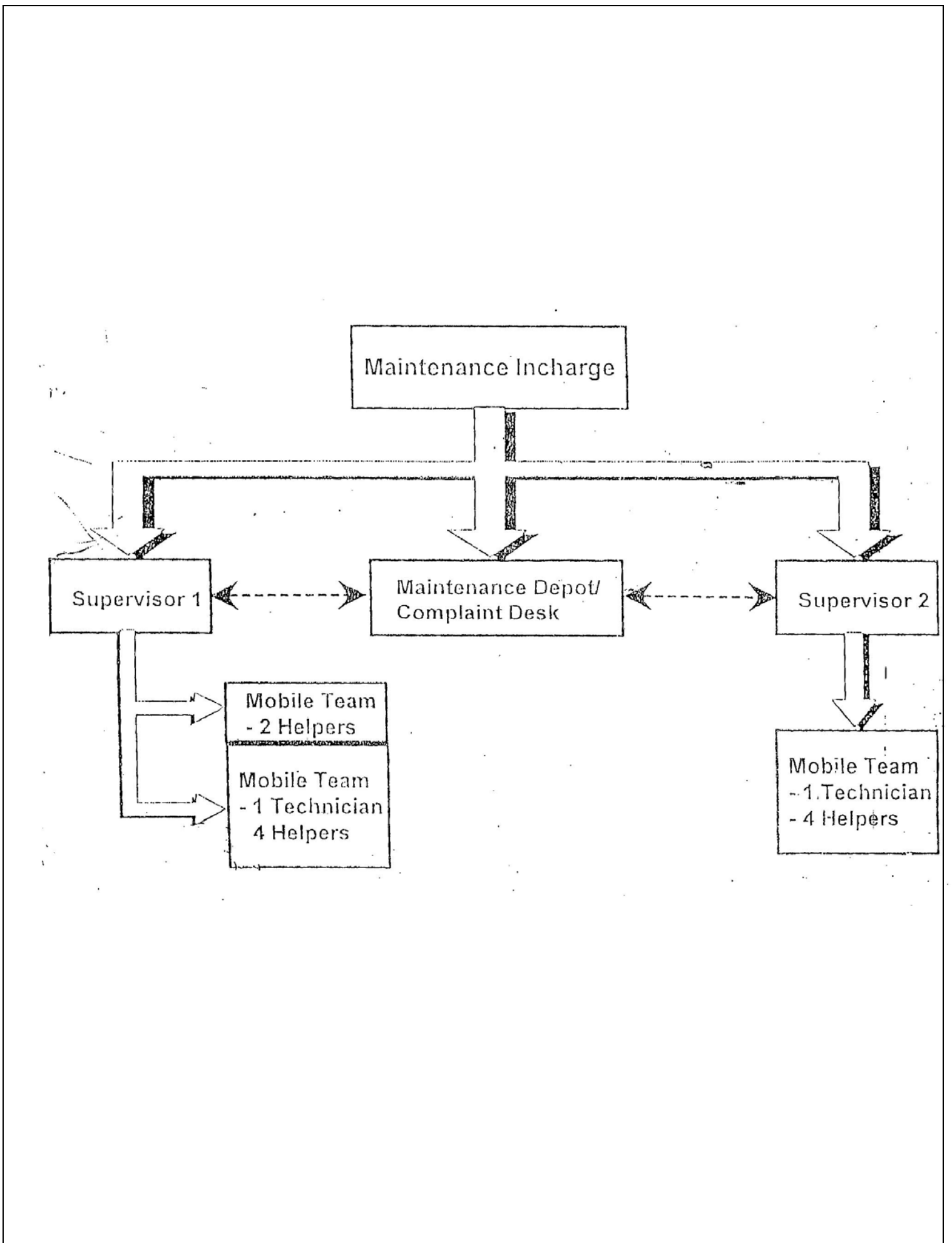
INVENTORY

STOCK INVENTORY OF TRAFFIC SIGNALS PART IN TCD STORE

S.NO	ITEM	STOCK IN HAND
1	3-WAY ASPECT 200 MM	27
2	3-WAY ASPECT 300 MM	29
3	1-WAY ASPECT 200 MM	NIL
4	1-WAY ASPECT 300 MM	02
5	2-WAY ASPECT 200 MM	78
6	STANDARD POLE	142
7	MAST ARM POLE	28
8	PEDISTRIAN PUSH BUTTON	114
9	CABLE 12 CORE	250 METER
10	REGULATORY SIGN 300 MM	NIL
11	CONTROLLER T-400 (8-PHASE)	04
12	CONTROLLER T-400 (16-PHASE)	07
13	CONTROLLER CASE	NIL
14	CONTROLLER PLINTH (ST-800)	01
15	C P U T-400	NIL
16	4-PHASE DRIVER CARD	NIL
17	MANUAL PANNEL	NIL
18	HAND SET	01
19	GLASS 200 MM	NIL
20	RUBBER GASKIT 200 MM	36
21	HOOD 200 MM	NIL
22	MOUNTING BRACKET 200 MM	NIL
23	ARROW BRACKET 200 MM	NIL
24	ARROW MASK 200 MM	NIL
25	GLASS 300 MM	49
26	RUBBER GASKIT 300 MM	58
27	HOOD 300 MM	24
28	ARROW BRACKET 300 MM	NIL
29	POWER SUPPLY UNIT T-400	NIL
30	CAPACITOR	19
31	S S R	38
32	BATTERY	111
33	RELAY -A	112
34	RELAY -B	116

35	MAIN HRC FUSE	34
36	FUSE FS-7	61
37	FUSE FS-8	123
38	REGULATORY SIGN FUSE	78
39	CONFIGURE EPROM	52
40	CONFLICT EPROM	52
41	MAIN CONTROLLER SWITCH	59
42	SOCKET FOR REGULATORY SIGN FUSE	90
43	DOOR LOCK	12
44	CONTROLLER DOOR GASKIT	01
45	SCREW LOCK BOLT	34
46	SCREW LOCK NUT PLATE	50
47	REFLECTOR 200 MM	205
48	REFLECTOR 300 MM	27
49	HANGING BRACKET	NIL
50	ARROW MASK 300 MM	57
51	LOOP CABLE	NIL
52	CONTROLLER ST-800 (16-PHASE)	04
53	3-WAY ASPECT 200 MM (BLACK WITH LED BALL)	NIL
54	1-WAY ASPECT 200 MM (BLACK WITH LED BALL)	NIL

APPENDIX “C”
MAINTENANCE
ORGANIZATION CHART



APPENDIX “D”
FORM FOR THE CHANGES REQUIRED BY
THE ENGINEER

APPENDIX “E”
DAILY FAULT LOG

DAILY FAULT LOG

S.NO	COMPLAINT NO.:	INTERSECTION NO.	REPORTING TIME	SOURCE OF COMPLAINTS	NATURE OF FAULT	FAULT ATTENDED ON	FAULT CLEARED ON	REMARKS
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								

Notes:-

Fault Nature: L=Lamp Failure, T=Timing Changes, C=Controller, D=Damages, A=Any Other
 Complaint No. to be a four digit serial number (e.g. C0001, C0002 continued on the next date / page

**APPENDIX “F”
DAMAGE REPORT**



MAINTENANCE OF TRAFFIC LIGHT SIGNAL CDGK

Equipment Damage Report No _____

Name _____

Damage Occurred On: _____

Equipment And Material To Replace Or Repaired

BOQ NO	DISCRIPTION	QTY	BOQ RATE	TOTAL	REMARKS Needs replacement/missing	REPLACE /REPAIR	QTY	COST INCURED
	Subject to availability							

COMPONENTS OF ASPECTS IN GOOD	
CONDITION AFTER DAMAGE	QTY
HOOD	200MM/ 300MM
LENS	200MM/ 300MM
GASKIT	200MM/ 300MM
REFELECTOR	200MM/ 300MM
1-WAY REAR HEAD BODY	200MM/ 300MM

Equipment be Replaced /Repaired

THE ENGINEER

PECTHD

LACED

AIRED

Contractor/Engineer

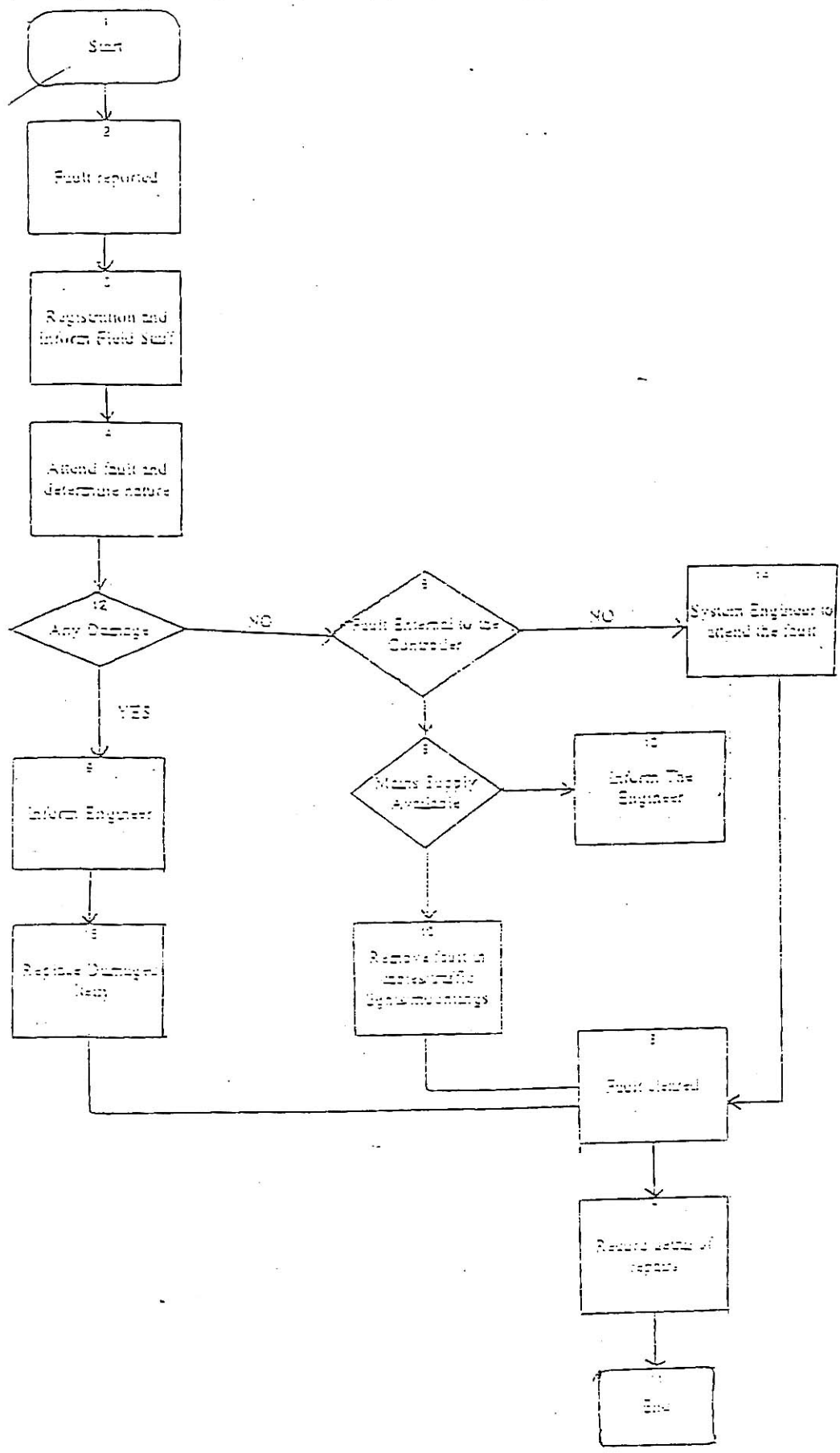
PECTHD

LACED

AIRED

T C D Representative

APPENDIX “G”
FAULT ATTENDANCE FLOW
CHART



**APPENDIX “H”
YEARLY MAINTENANCE
RECORD**

WEEKLY CLEANING OF SIGNAL HEADS.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

MONTHLY CLEANING OF SIGNAL HEADS

Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

Innals

CLF CLOCK SETTING

Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

COMPLAINT RECORD

Comp No																												
Date																												

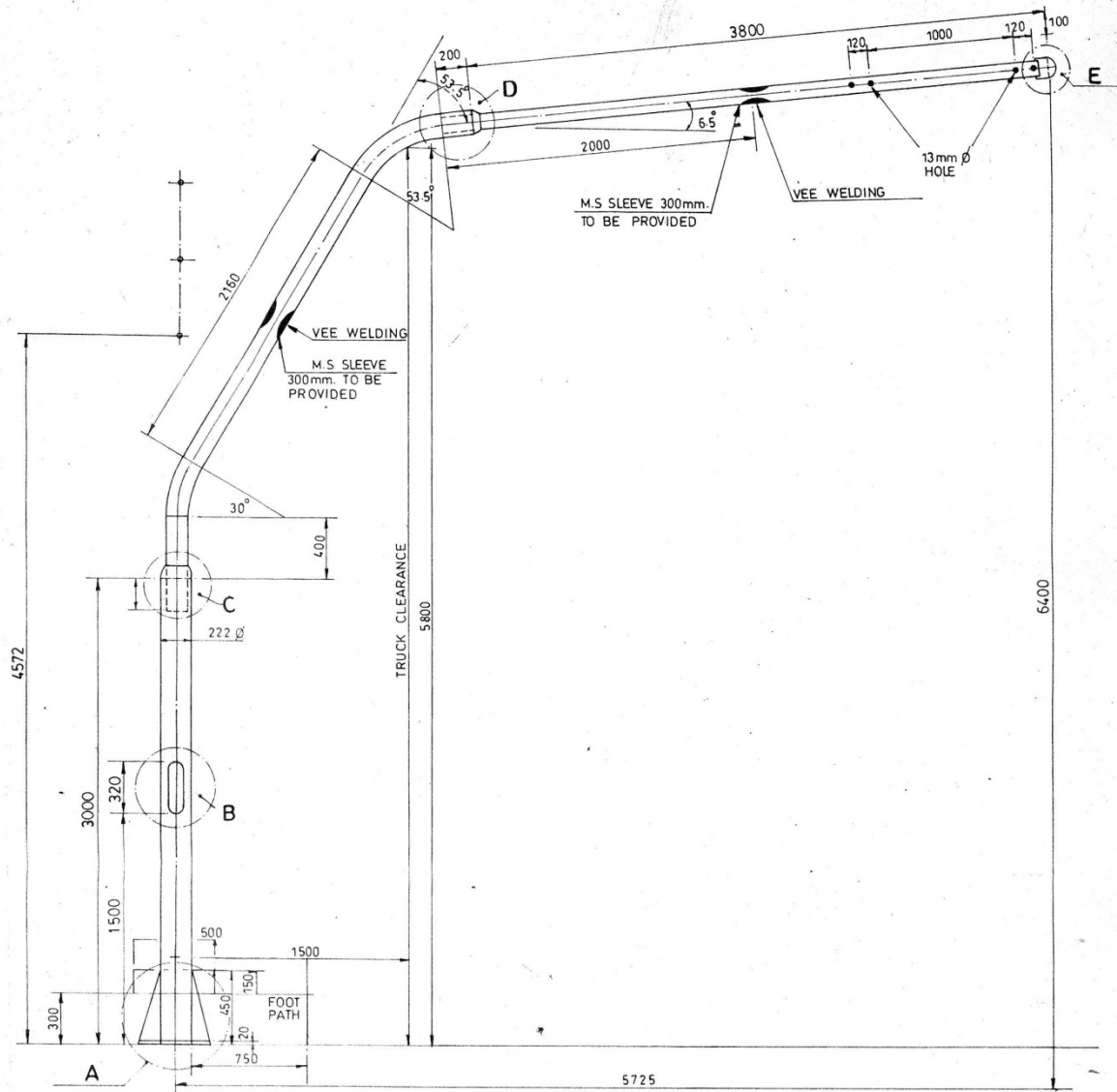
DAMAGES

Damage Rp #/ Date:	Damage Rp #/ Date:	Damage Rp #/ Date:
Damage Rp #/ Date:	Damage Rp #/ Date:	Damage Rp #/ Date:
Damage Rp #/ Date:	Damage Rp #/ Date:	Damage Rp #/ Date:
Damage Rp #/ Date:	Damage Rp #/ Date:	Damage Rp #/ Date:

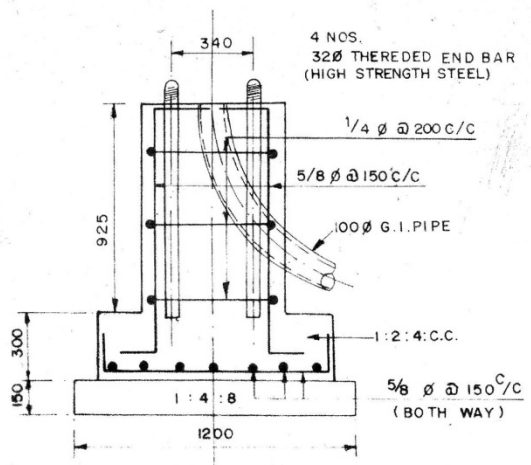
CHANGES REQUIRED BY THE ENGINEER

Sr No. / Date:	Sr No. / Date:	Sr No. / Date:
Sr No. / Date:	Sr No. / Date:	Sr No. / Date:
Sr No. / Date:	Sr No. / Date:	Sr No. / Date:
Sr No. / Date:	Sr No. / Date:	Sr No. / Date:

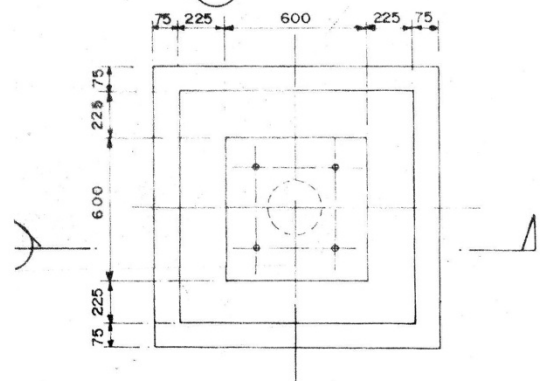
Repainting Of Signal Poles	Visual Inspection of Controller	Cable Termination Checking
First		
Second		



DETAILS OF MAST ARM POLE

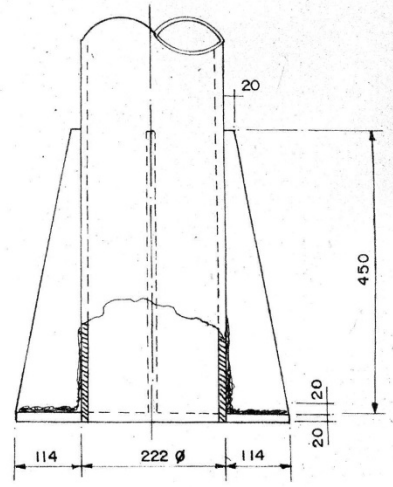


SECTION

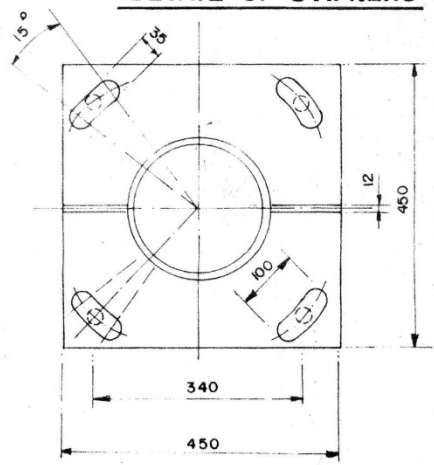


PLAN

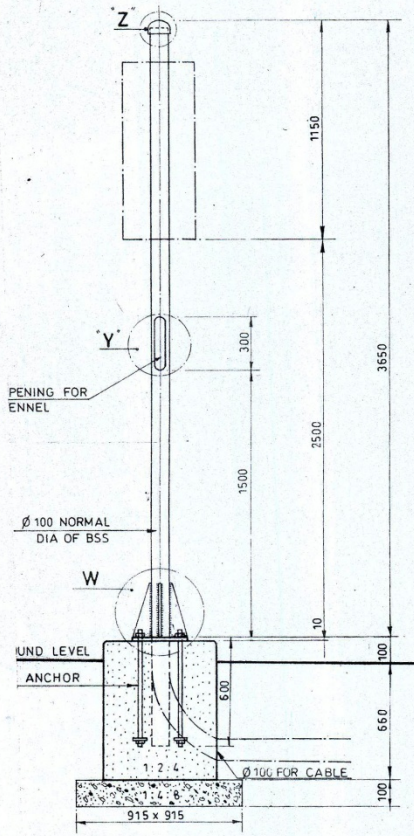
DETAILS OF FOUNDATION
(FOR MAST ARM POLE)



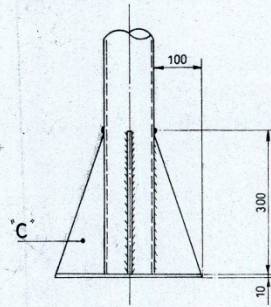
DETAIL OF STIFNERS



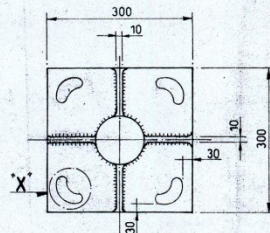
DETAIL OF BASE PLATE
(FOR MAST ARM POLE)



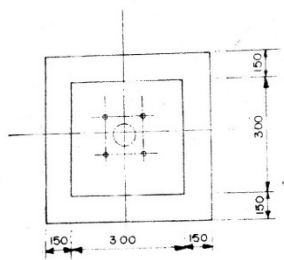
SIGNAL POLE



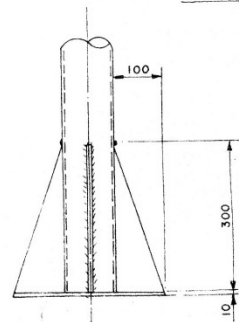
DETAIL-W



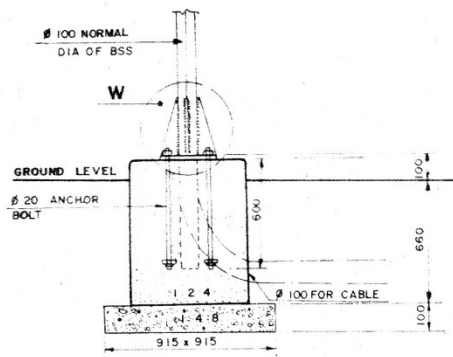
**DETAIL OF BASE PLATE
(FOR SIGNAL POLE)**



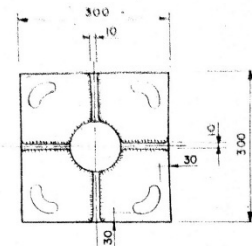
PLAN



DETAIL-W



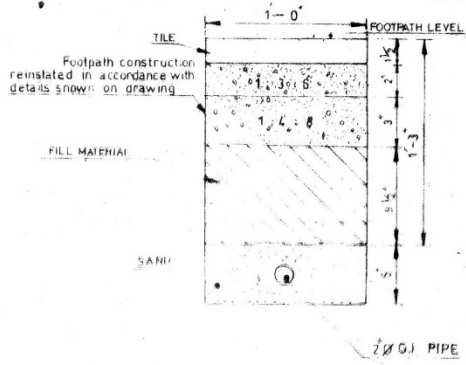
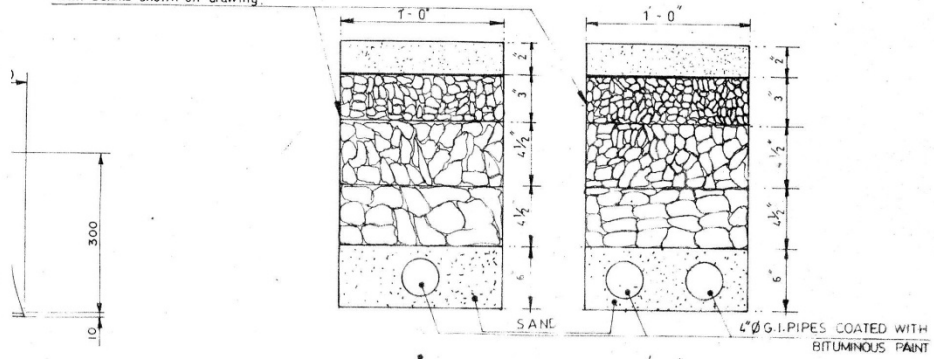
NORMAL SIGNAL POLE



**DETAIL OF BASE PLATE
(FOR SIGNAL POLE)**

Road cons
with detail

Road construction reinstated in accordance with details shown on drawing.

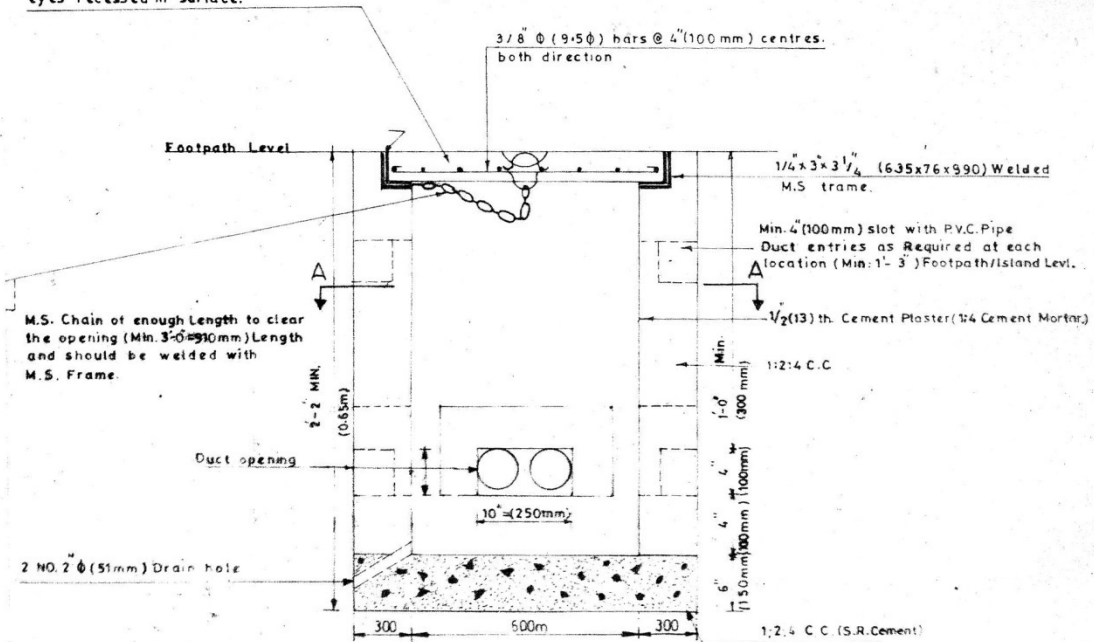


CABLE DUCT DETAIL

PLATE
(LE)

Cover 3x2-6x2-6 (76x760x760)
 R.C.C Cast in 1/4x3x3 (635x76x76) welded
 M.S. frame with 2 no. lifting
 eyes recessed in surface.

3/8" ϕ (9.5 ϕ) bars @ 4" (100 mm) centres.
 both direction



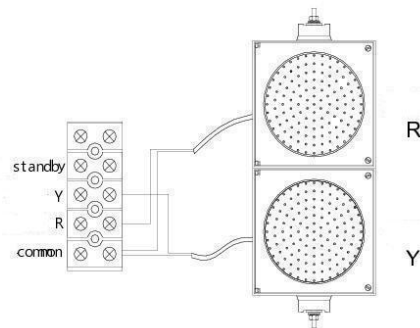
CABLE DUCT DRAW CHAMBER

300/200MM FULL BALL LED TRAFFIC LIGHTS

Model. SIEMENS TURKISH



Connection Sketch



Black : Common
 Red : Red light
 Yellow : Yellow light

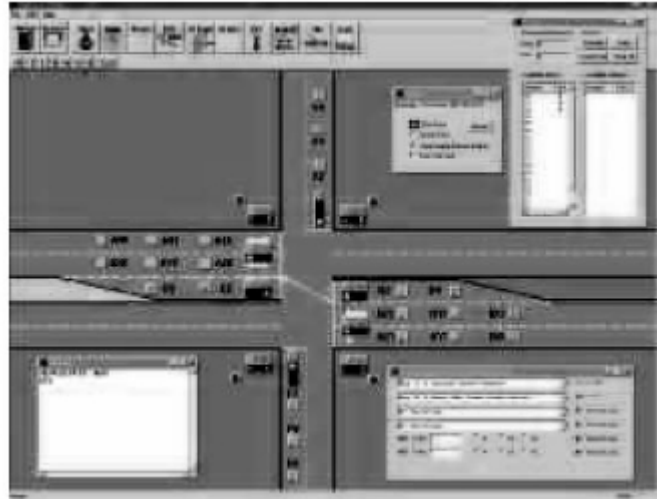
Product Photo



Product Features

- Novelty design with beautiful appearance
- Low power consumption
- High efficiency and brightness
- Large viewing angle
- Long lifespan-50,000-80,000 hours
- Multi-layer sealed and waterproof
- Exclusive optical lensing and good color uniformity
- Long viewing distance
- Keep up with CE, GB14887-2007, ITE EN12368 and relevant international standards

The ST800 is the latest high performance traffic controller from Siemens. It is designed for maximum flexibility in a wide range of applications including intersection and pedestrian traffic control. The ST800 family provides intersection, Pelican, Puffin and Toucan strategies to UK Department of Transport Specification TR221 0 and meets the essential requirements of European Specifications prEN12675 and prEN50278.



ST800 traffic controller

Modular construction

Two main construction options are available:

- **Standard outercase** - A single-sided case provides a controller logic rack and frame which swings out for ease of access. Up to 32 phases can be accommodated together with detectors and ancillary equipment including Outstation Transmission Units (OTU), Outstation Monitoring Units (OMU) and other approved items.

The outercase provides all necessary street cable terminations using CET connectors, with ample room for additional terminations and cable separation if required. Manual panel access is provided through a separately locked access door contained within the main outercase door.

- **Free-standing logic rack** - A free-standing 19 inch 6U controller rack contains all essential controller electronics within a self-contained unit. An extensive range of mounting kits is available for fitting the equipment into a variety of existing cabinets, providing a particularly cost effective route to controller modernisation.

Phase cables are supplied which can be connected to existing terminals in the host cabinet further easing the upgrade process.

A basic controller comprises a processor board offering 16 buffered inputs and a single 8-phase lamp driver board.

Expansion to a maximum of 32 phases is accomplished by the addition of up to three further lamp driver boards. Expansion I/O boards, integral OTU, and SDE/SA processor boards may be added as necessary.

The controller design follows a modular concept which means that the equipment can be supplied to match individual user specification.

Simplified installation

Installation is simplified by the modular nature of the equipment. The controller root and cabinet, complete with street cable and mains supply termination may be installed without the logic rack, which can be added at a later date.

An extensive inbuilt self-test facility which validates both the controller hardware and the street connections provides an invaluable aid to controller commissioning.

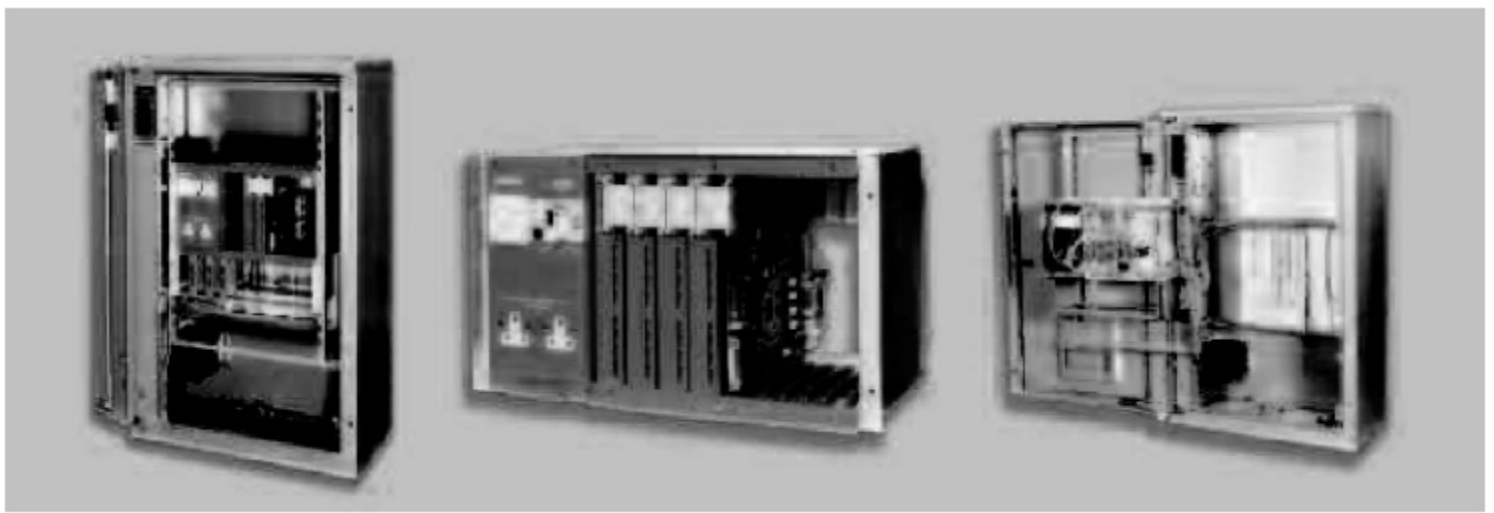
User configurable

Enhanced navigation aids and selectable levels of configuration complexity, insulate the user from controller facilities that are not being used, simplifying the configuration process.

The configuration generated by the system contains the data required to allow the controller to operate and also the IC4 source data, ensuring that it can never be lost. The data can be retrieved via the handset port in typically less than one minute and subsequently edited to create a new configuration.

Existing data for T200 and T400 controllers produced using the earlier IC3 system can be imported as the basis of new ST800 configurations, significantly easing controller upgrades. Similarly Linsig™ generated data files can be imported.

The optional emulator is a feature rich tool which links seamlessly with IC4 to provide an advanced environment for de-bugging and proving ST800 configurations. It ensures a highly accurate representation of the controller operation on a PC, using the same software source files as the controller firmware.



The IC4 Configurator provides a Windows™-based easy to use tool for generating configuration data sets for the controller. Data is entered via a series of 'forms' and is validated for correctness as part of a sophisticated error checking process.

Once configured most controller timings and many other parameters may be altered using a simple hand-held terminal. Using Siemens IC4 configurator, the changes made in this way can be easily identified and automatically incorporated into the controller configuration.

For non-UK applications the handheld terminal may be used to change more widespread parameters including number of stages and number and types of phases. This allows a single configuration PROM to be created and then quickly customised on-street.

Enhanced safety features

Two independent microprocessors and comprehensive hardware self-check features ensure an unprecedented level of controller safety. This is further improved by full equivalence monitoring on all aspect drives (red, amber, green) ensuring that mis-display of any signal colour is prevented.

For UK applications, conflicts or other major failures result in the signals being extinguished in a fail-safe manner. For non-UK use the controller also features a built-in hardware fail flash. This offers selectable 'off' or flash red/yellow for each phase, with programmable mark/space and flash rate.

Reliable facility rich software

The controller software offers many features and facilities including:

- 32 phases, 32 Stages
- 8 streams
- 8 maximum green sets
- 8 hurry calls which are in priority order
- 8 uni-directional detector loop units
- Stage ripple change facility for improved intersection capacity
- Fully configurable lamp sequences for worldwide application
- Fully integral lamp monitoring with enhanced red lamp monitoring to significantly ease configuration, commissioning and use
- Improved part-time and start-up modes, such that a stream may be sent in and out of part-time mode without affecting any others.
- Capability to provide different phase extension times on an input basis
- Enhanced CLF with plans now having up to 32 groups and the timings specified in seconds as part of the total cycle time
- Improved event timetable which supports actions based on 32 independent events and simplified programming
- Enhanced time system with full date details
- Date stamped rolling log providing detailed history of events and faults, coupled with improved presentation to aid recognition of entries
- Improved UTC mode with independent G1/G2 reply bits on a stream basis
- Enhanced handset facility running at 1200, 9600 or 19200 baud that can produce a 14 character single line display up to an 80 character by 24 line full screen status display, which displays the result of up to 10 handset commands simultaneously.

Technical specification

Modes of operation

Manual
 Vehicle Actuated
 Vehicle Actuated - Ripple
 Pedestrian Fixed Vehicle Period
 Urban Traffic Control
 Bus/Light Rail Transit
 Part Time
 Fixed Time
 Cableless Linking
 Pedestrian Vehicle Actuated
 Puffin/Toucan
 Hurry Call
 Emergency Priority

Phases and stages

No. of hardware phases	1-32
No. of software phases	0-32
Phase sequences	Programmable
No. of independent streams	8
No. of stages	32
No. of max. green periods	8
No. of phase delays	120
No. of call timers	8
No. of cancel timers	8
No. of all red extension units	7
No. of hurrycalls	8
No. of emergency/priority units	8

High speed vehicle detection

Speed discriminations	Double/triple
Speed assessment	
No. of assessors	16

Cableless linking facilities

No. of plans 16
 No. of groups per plan 32
 No. of time switch settings 64
 No. of plan influence tables 16
 No. of group influences 10
 Timing sources 50/60Hz mains
 Internal crystal
 GPS clock
 64 days
 32 holiday periods
 Holiday clock

Other facilities

Standby mode: Signals off
 or software flash
 Failure mode: Signals off
 or hardware flash

Hardware flash - selectable flash red or yellow per phase. Mark/space and flash rate selectable for whole controller.
 Signal dimming 120V, 140V, 160V
 High speed handset port 1200, 9600 and 19200 baud
 Port is auto bauding to match incoming data

Electrical

Power supply 115V -20% +15%
 230V -20% +15%
 Supply frequency 50/60Hz
 Lamp switching type Solid state
 Phases per lamp switch card 8
 Max. load per output 4A
 Max. load per lamp switch card 20A
 Max. controller lamp load 20A
 (Heavy current option available for higher lamp loads)

Environmental

Designed to meet: UK TR2210
 EU prEN1 2675
 EU prEN50278

Supply interruption:
 Continuous operation up to 50ms break
 Supply failure:
 Automatic restart without operator intervention
 Operating temperature range -25oC to +65oC

Dimensions

Standard outercase Height 1160mm
 Width 725mm
 Depth 420mm
Rack system Height 266mm
 Width 482mm
 Depth 280mm

(Rack system requires minimum 15mm clearance in front of fixing plane)

Cuckoo kits

Siemens controllers:	GEC controllers:
Siemens T70	GEC 25
Siemens T90	GEC CX
Siemens T200	GEC3000
Siemens T400	
Siemens TCUG case	
Ferranti controllers:	
Ferranti MK1 (single and double case)	
Ferranti MK2	

Signal heads for road traffic



SIEMENS

Siemens signal heads ... safe, reliable, environmentally compatible, energy-saving, attractively priced

LED signal heads

These days, LEDs are the predominant form of illumination for signal heads, having largely superseded conventional signal lamps.

This technology consumes little power, yet today's LEDs achieve top traffic signal performance.

LED signal heads with their bright evenly illuminated lights are reliably seen by road users, even in unfavorable lighting conditions, and using LEDs practically eliminates the disorienting phantom reflections that occur when the sun is very low.

The electrical interface to the controller is provided by a connection enabling LED signal heads to be operated on Siemens controllers compliant with HD 638 / DIN VDE 0832 00.

LED lights have a considerably longer lifetime than conventional signal lamps and ensure a high level of reliability of the system. Failures caused by defective signal lamps are a thing of the past.

The higher efficiency of LEDs means that their electrical power consumption is vastly reduced, so running costs for power supply are correspondingly low. LED signal heads with their low energy consumption thus represent a valuable contribution to environmental protection: saving up to 90% of the energy consumed by signal lamps

Conventional signal heads

Signal heads with conventional signal lamps are used throughout the world and can be expanded with a wide selection of individual parts and accessories.

The product portfolio includes conventional high-voltage signal heads with 230 V signal lamps. Low-voltage technology (120 V) enables your energy consumption to be significantly reduced, right down to around 20 or 30 W.

PLUS signal heads

The lamp circuits in signal heads with PLUS technology are switched decentrally in the signal heads themselves. This provides for marked reductions in the cabling outlay and in the work needed to take the units into operation. PLUS technology is available for 40 V LED and 120 V lamp designs.

- **Millions of Siemens signal heads have proven their value in everyday use.**
- **They have demonstrated their capabilities in many different countries in the most adverse weather conditions.**
- **They blend very well into any urban situation and have been awarded with the seal of "Good Industrial Design".**



Siemens signal heads ... your choice

Signal heads are classified either as LED signal heads or conventional signal heads.

Siemens offers the following LED signal heads:

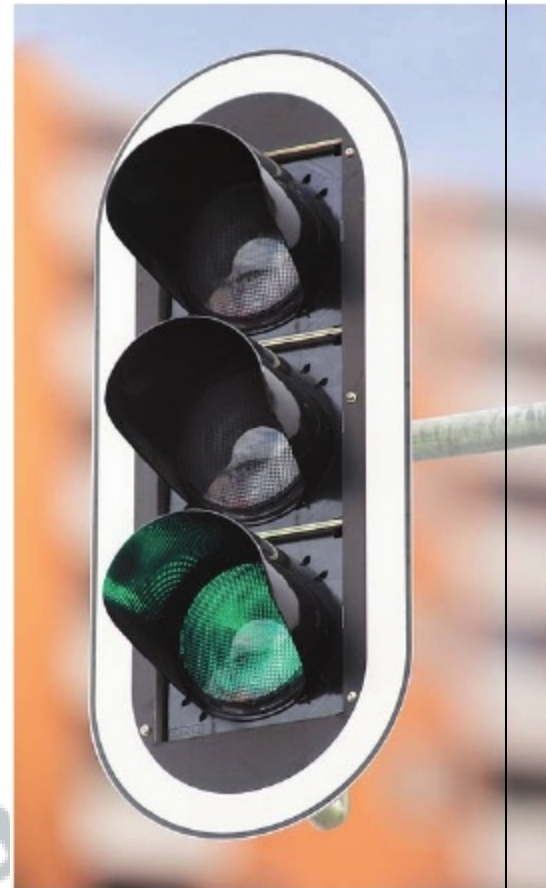
- Units with 230 V technology
- Units with 40 V technology

Siemens also offers the following conventional signal heads:

- Units with high voltage 230 V technology
- Units with low voltage 0 V technology

All LED signal heads from Siemens are equipped with a central light source comprising one or more high-performance LEDs. The light is refracted by a Fresnel and diffusing lens to obtain optimum emission characteristics. The signals can be easily seen from all angles and always show an homogeneous illumination.

The luminous intensity has been optimized to achieve a high level of recognition of both signals and symbols regardless of the environmental conditions. The luminous intensity is more



wondersha

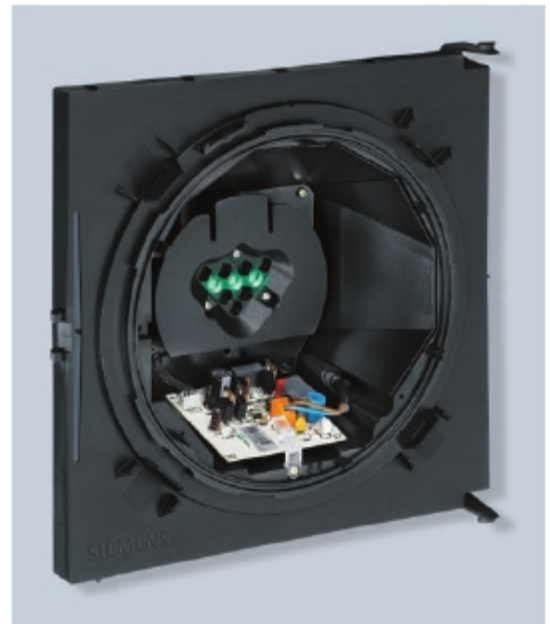
LED signal heads using 40 V technology and conventional signal heads with low voltage 0 V technology are also available as PLUS signal heads.

LED signal heads

LED signal heads have considerable advantages over conventional signal heads and are used today in practically all new systems. Thanks to their modular design, existing systems can be refitted with LED signal head technology with a minimum of effort.

The benefits of Siemens LED signal heads at a glance:

- Brilliant optical properties
- Colorless lenses eliminate phantom color effects
- Phantom class 5 (for almost all colors and sizes)
- Energy savings of up to 90% as compared to conventional signal lamps
- High level of EMC immunity
- Optimized electrical interface for SIEMENS controllers
- Significantly longer life than conventional signal lamps
- Increased availability of your traffic signal systems



than adequate, even on bright days, while at night the symbols are not so brightly illuminated as to be difficult to recognize.

Safety technology

To ensure the safety of the traffic light system, each LED light source is equipped with an electronic monitoring circuit that has been certified by the TÜV (the German safety standards authority). The current and voltage of the LEDs are continually monitored. If the forced deactivation circuit registers values indicating that illumination performance conformant to standards can no longer be assured the current at the input is interrupted, thus enabling the controller to detect the fault in the LED unit.

SILUX LED signal heads with background screen

SILUX LED insert, view of the i

VOLUME-I

KARACHI METROPOLITON CORPORATION

TRANSPORT & COMMUNICATION DEPARTMENT

TENDER DOCUMENTS

SINGLE STAGE – ONE ENVELOPE SYSTEM

BASED ON SPPRA RULE 2010



INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING TRAFFIC

SIGNALS IN KARACHI (ZONE-II)

**VALIDITY OF TENDER: 90 DAYS
TO BE OPENED ON: 26TH AUGUST**

TENDER COST: Rs. 3,000/-

**DIRECTOR (TC&O)
T&C DEPARTMENT, KMC**

No. _____
ISSUE TO M/S _____

DATED: _____
P.O. NO: _____
DATED: _____
BANK: _____

Signature & Stamp of Issuing Authority

1. INTRODUCTION & BACKGROUND

- 1- TCD KMC is controlling / regulating the traffic throughout signalized UTC and NON-UTC system in all over Karachi 106 nose of traffic signal Since 1998 on every year annual contract is invited has being awarded to the firm eligible. For monitoring the system and keep it's operating System 24/7 round the clock throughout the year. The list of intersection being mention and operation is annexure A.
- 2- Presently the system is in operative condition and being maintained by The TCD Department through the contractor / firm.
- 3- The TOR as under.

2. THE REQUEST FOR PROPOSALS (RFP)

- 1- This request for proposal RFP is issued by transport & communication department on the behalf of the Karachi Metropolitan Corporation. It invites well reputed firm having experience in the field of traffic signalization, operation & maintenance.

3. RESPONSIBILITIES OF THE CONTRACTOR

Maintenance Requirements for Contractor

The maintenance requirements of the Urban Traffic Control System works I fall into following two categories:

- Routine Maintenance of Traffic Signal Equipment and Controllers.
- Fault Call Out Maintenance

1.1 Routine Maintenance

Daily

Visit of all signal sites and replacement of fused lamps if any and submission of status of complaint / repair.

Fault Call out Maintenance

Monthly

1. Cleaning of Signal Heads and Signal Poles
2. Checking/ Calibration of clock of each controller with master controller

Half Yearly

Repainting of Signal Poles

Controller Functional Checks

Visual Inspection of Controller, Cable Termination

FLASHER

Daily visit of all solar flashers.

Weekly Cleaning of solar panel, light and pole

Half Yearly Repainting of flasher pole.

4. BASIS FOR SELECTION OF CONTRACTOR / FIRM

- The Contractor/firm will be selected through competitive tendering process in accordance with the Sindh Public Procurement Rules 2010 and as per the two levels evaluation criteria specified below:

Level – 1 Technical Evaluation primarily concerning experience in signalization of intersection especially T-400 and ST-800 Traffic controlling system, Maintenance of traffic signals and financial standing of the firm.

Level – 2 Financial Evaluation, basically comparison of Financial Bids.

5. THE PROJECT TERMS:

The initial term will be one (01) year, renewable for another term subject to performance evaluation and as per mutual consent of the parties, OR the project will be re-tendered accordingly.

6. THE RFP PACKAGE:

The services to be provided by the bidders, the procedures to be followed during the tendering process, and the terms and conditions of the draft Agreement are described in this RFP Package. The RFP Package consists of:

The RFP

Annexure H to the RFP – Bidder's Commitment Letter

7. PROJECT MONITORING:

The process will be conducted solely under the direction and supervision of the Senior Director, T&C Department, KMC.

8. TIME TABLE:

The time for submission of proposals by the bidders is 26TH August, 2015 up to 02:30 PM. Proposal shall be opened on the same day at 03:00 PM.

9. PROPOSAL FORMAT AND CONTENT:

Contents of the Proposal

Each proposal shall consist of the Bidder's Commitment Letter (Annex 'J' to this RFP), together with the following.

Technical Proposal containing the following information:

- (i) Confirmation of conformance with all mandatory tender requirements and a description of the corporate structure of the bidding entity and its relation with companies and individuals associated with the proposal;
- (ii) Evidence relating to financial capability to provide the services, including audited financial statements for the most recent three years for the bidding entity and/or consortium members and/ or parent company(i.es) as appropriate details of any encumbrances, contingent liabilities, and/or outstanding claims that may materially affect the financial position of the bidding entity.
- (iii) The earnest money of 2% of offer rates shall be deposited by the bidder along with the bid in the form of pay order/ bank draft in the name of Transport & Communication Department, KMC, with the Financial Proposal.

Financial Proposal containing the following information:

The financial proposal shall comprise of the bid form attached with the RFP.

10. COST OF PROPOSALS:

The bidder shall bear all costs and expenses with respect to the preparation and submission of its proposal and its participation in the tendering process.

11. PERIOD OF VALIDITY OF THE PROPOSAL:

Proposals shall remain valid for a period of 90 days commencing at the Submission Deadline as established by RFP or as amended pursuant to RFP.

The KMC may solicit bidders' consent to an extension of the Proposal Validity Period Up to 120 days.

12. MODIFICATION OF PROPOSALS:

Bidders cannot modify proposal after submission.

13. WITHDRAWAL OF PROPOSALS:

A bidder may withdraw its proposal after submission provided that a Notice of Withdrawal is received by the KMC prior to the Submission Deadline.

14. SUBMISSION, RECEIPT AND SIGNING OF PROPOSALS:

The bidder shall the proposal under One envelop systems, that is, the technical and financial proposals is one envelop clearly marked technical and financial with original and one duplicate copy at the following address:

Senior Director,
Transport & Communication Department, KMC,
8th Floor, Civic Centre, Gulshan-e-Iqbal, Karachi.
Tel: 021-99230655 – Fax: 021-99231787.

15. OPENING AND EVALUATION OF PROPOSALS:

Opening of Proposals:

The proposal submitted on or before the Submission, Deadline, will be opened on the same day at 03:00 PM, in the presence of the bidders' representatives who choose to attend the opening.

16. Only the names of bidders shall be announced who submitted the proposals.

17. Bidders' representatives who attend the opening of the bid envelopes shall sign a register to record their attendance.

18. EVALUATION OF PROPOSALS:

The Evaluation of Proposals shall be undertaken by the designated Evaluation Committee after the deadline for submission of proposals. Any proposal not in conformity with the prescribed bidding procedure and requirements in the RFP will be disqualified.

The Technical proposals shall be evaluated first in accordance with the evaluated criteria prescribed below. The bidders who will secure 70 points shall be considered technically qualified. The financial proposals of the technically qualified bidders shall be opened in the presence of bidders. The Evaluation Report shall be hoisted on KMC website and that of the prior to the award of contract.

TECHNICAL EVALUATION CRITERIA:

The Technical Proposal shall be evaluated as per the following criteria:

S.NO	CRITERIA	DISTRIBUTION	MAXIMUM
1	<p><u>Qualification / Experience of firm</u></p> <p>A. Experience in maintenance of traffic Signals T-400 and ST-800 Controllers (Attached documentary evidence)</p> <p>1. For Last 3 years experience 05</p> <p>2. For Last 5 years experience 15</p> <p>B. Experience in installation of traffic signals (Attached documentary evidence) List of related project complete</p> <p>1. Signal related project completed in last 3 years 05</p> <p>2. Signal related project completed in last 5 years 10</p>		20
2	<p><u>License</u></p> <p>1. PEC license in relevant category EE-06 ,EE- 07 & CE-10 (Attached documentary evidence) 15</p> <p>2. Electrical License 05</p>		20
3	<p><u>Support For Improvement/Installation/Repair</u></p> <p>1. Sufficient inventory of Genuine spare parts of traffic signals (Specially T-400 & ST-800 Controllers & German & Turkish Lights) (Attached documentary evidence). 15</p> <p>2. Principle letter for support of equipment of traffic signal equipment. 05</p> <p>3. Laboratory duly equipped with necessary tools and software rand repaired of phase driver card and mother board.,(with documentary evidence) 15</p>		35
4	<p><u>Engineer depute in maintenance of traffic signal.</u></p> <p>1. Electrical engineer (Attached Valid PEC Registration certificate / Card. 05</p> <p>2. Electronic engineer (Attached Valid PEC Registration certificate / Card. 05</p>		10

METHOD OF PROCUREMENT USED

SINGLE STAGE – ONE ENVELOPE PROCEDURE (RULE 46 (1) OF SPP RULE 2010)

46 (2) SINGLE STAGE – ONE ENVELOPE PROCEDURE

- a) Notice Inviting Tender and bidding documents of this method shall contain the following eligibility criteria:

The following works from Firm / Contractors Registered with P.E.C in C-5 Category with special category for signalization work EE-06, EE-07 & CE-10 and having Valid/renewed license of PEC.

Valid Electrical License of the Firm issued from Government of Sindh.

Valid NTN and paid up original challan of professional Tax prescribed fee.

The bidders shall provide evidence to the satisfaction of employer of their eligibility and their capability and adequacy of resources to carry out the contract effectively.

Tenders will be issued to those firms/contractors who provide letter from principal / original equipment manufacturer for promising of technical and equipment supply support.

The Firm/Contractor minimum last four years experience in relevant field with any public sector / organization.

The Firm /Contractor must have laboratory duly equipped with necessary tools and software for repair, configuration and re-configuration of the controller.

The Firm / Contractor have must sufficient inventory / procurement arrangement of Genuine Spare Parts, (attached documentary evidence).

- b) All bids received shall be opened and evaluated in the manner prescribed in the Notice Inviting Tender or bidding document.

Minimum Qualification / Eligibility Criteria*

The evidence / documents of the following minimum qualification / eligibility criteria will be checked during opening process of tender & if anyone is missing then the tender will be summarily rejected at the moment by the tender opening committee.

Eligibility:

- Valid PEC in C-5 category along with special category for signalization work EE-06, EE-07 & CE-10.
- Electrical License of the firm issued from Government of Sindh.
- Valid Professional TAX Certificate.
- Minimum last four years experience in Existing Signaling System with any Public sector / Organization.
- NTN Certificate

Minimum Qualification Criteria:

- Bid Security, as mentioned in the NIT & Bidding Documents, is furnished.
- All rates quoted including the total amount of the bid shall be in figures & words (both).
- All corrections / overwriting shall be clearly re-written with initials & duly stamped by the bidder.
- The bid shall be properly signed, named & stamped by the authorized person of the firm and authorization letter for signatory shall be enclosed with the tender by the authorized person, if other than the signatory of the firm.
- Evidence of employing Engineer as declared in the PEC License should be provided in shape of copy of Engineer's Registration certificate by PEC.
- Bank certificate of firm.
- The minimum work experience with satisfactory completion report in last 4 years in Maintenance/Installation of traffic signals.

KARACHI METROPOLITAN CORPORATION

TRANSPORT & COMMUNICATION DEPARTMENT



TERMS OF REFERENCE (TOR)

FOR

**INSTALLATION / IMPROVEMENT AND UP-GRADATION OF EXISTING
TRAFFIC SIGNALS IN KARACHI (ZONE-II)**

1. Introduction

This document describes the System to meet the maintenance requirements for traffic signals in Karachi. During one year maintenance period.

2. Brief Maintenance Requirements

The maintenance requirements of the Urban Traffic Control System works fall into following two categories:

- Routine Maintenance of Traffic Signal Equipment and Controllers.
- Fault Call Out Maintenance

2.1 Routine Maintenance

Daily

Visit of All signal sites and replacement of fined lamps if any and submission of status of complaint/repair:

Fault Call out Maintenance

Monthly

1. Cleaning of Signal Heads and Signal Poles
2. Checking/calibration of clock of each controller with master controller.

Half Yearly

Repainting of Signal Poles
Controller Functional Checks
Visual Inspection of Controller, Cable Termination

2.2 Fault Categories:

- Urgent

And

- Less urgent faults.

Urgent faults are

- All aspects of one phase or more units.
- 50% of the red lamps on one phase unlit.
- Signals failing to change

- Defective signals/timings causing abnormal traffic conditions.
- Signals damaged and/or in a dangerous condition

2.3. Response Time

Urgent Faults

Within 1 hour on working day	if no other fault exists
Within 4 hours on working day	if any other fault exists
Within 4 hours on weekends and Holidays.	if no other fault exists
Within 6 hours on weekends and Holidays.	if any other fault exists.

Less urgent faults

To be responded to	within 10 contract hours
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2.4. Definition of Response

Attending the location of the fault within the periods defined above and continuously working during the contract hours to clear the fault.

2.5. Maintenance Working Hours

The working hours for maintenance shall be

0830 -1830	MON through SAT
0930 - 1700	SUN and Public Holidays
0830 -1500	during the Holy Month of Ramzan

Faults reported at times other than between the above working hours shall be deemed to have been reported on the start of next working days subject to clause 2.5 above. At weekends non-urgent faults shall be deemed to be reported two hours prior to the start of the next working day, No routine maintenance will be carried out on Eid days, 10th of Moharam and 14 August, however for emergency person will be available on working telephone to attend on call from TRANSPORT & COMMUNICATION DEPARTMENT

2.6. Maintenance Depot

A location serving as the base for maintenance activities is to be maintained. The complaints pertaining Traffic Signal Faults shall be reported at the Depot at a given 24 hour's Mobile number. Arrangements for receipt of complaints should be maintained on register.

2.7. Spares

All the spares for maintenance shall be specified and kept at the Contractor's depot. A perpetual inventory of spares shall be maintained by the Contractor and inspected by the Engineer at six monthly intervals. All die material and spare parts to be supplied and replaced shall be brand new and compatible with the corresponding part of the existing Traffic Signal Equipment installed at site.

2.8. Non Performance Rebates

One Rebate Unit (RU) =0.05% of the annual routine maintenance cost.

If the Contractor fails to meet the performance requirements regarding response and fault attendance one Rebate Unit for every four hour period in excess of the response times defined limited to a total of 100 RU, can be claimed by the Engineer.

Non performance rebates shall not be applicable if

1. The equipment has to be taken out of service for repairs or
2. It is necessary that the equipment be isolated from the mains supply for which the Engineer fails to provide a competent person or
3. The equipment is damaged and can only be 'made safe'

2.9. Schedule of Equipment to be maintained

The Contractor shall maintain all the street equipments mentioned in clause

3. Meeting the Requirements

3.1 Staffing

Maintenance team shall comprise of following personnel, strength whereof shall be kept according to the job requirements:

System Engineer (Maintenance In charge)

Supervisors

Technicians

Telephone Operator/Co-coordinator

Helpers

This team would be based at the UTC Project Depot and would employ and will be equipped with all required tools to carry out:

Routine maintenance as per specifications

And

Respond to Fault Call Outs.

3.2 Schedule of Equipment and Works to be maintained

The following equipments! Works at the intersections shall be maintained during the 12 months maintenance period

- Traffic Signal Controllers
- Traffic Signal Aspects and assemblies
- Mast arm and Standard Signal poles.
- Accessories to above.

3.3 Spares for Maintenance

The routine maintenance charges include the service to be rendered and cost for bulb replacement etc. and the replacement of spare parts on the stock of TRANSPORT & COMMUNICATION DEPARTMENT A tentative spares shall be arranged by the contractor on chargeable basis.

3.4 Maintenance Depot.

Maintenance Depot shall be equipped to receive fault complaints. The address of the Maintenance Depot and 24 hour Mobile Telephone No. shall be communicated to the Department before the start of the contract.

3.5. Routine Maintenance Services

Following are the broad functions of the maintenance teams to perform maintenance services:

- General Inspection and Fault Reporting
- Replacement of fused lamps
- Cleaning of Signal Heads and Poles
- Clearance of Damaged equipment from the street
- Repainting of signal poles
- Replacement of spare parts on stock of T & C

The System Engineer shall be the overall in charge to perform the maintenance activities shall have following specific tasks:

- Contact the Engineer or any person authorized by the Engineer daily upon commencement of maintenance working hours to inform the schedule of works during the day or Fax the program of the day to the office of the Engineer.
- Overall administrative control of maintenance set-up
- Fine tuning of all the controllers as & when required to activate customize the new time plans generated according to traffic load on the junction.
- Attending Controller faults.
- Making timing changes upon written request of the Engineer.
- Synchronization of CLF Clocks (if required)
- Inspection of controllers
- Document fault reports, damages, spare requirements and monthly progress to tile Engineer.
- Daily report of the status of each complaint attended/fault rectified or otherwise.
- Daily inspection of 60 Traffic signal equipments on all the junctions jointly along with the representative of the Engineer In charge, Transport to be arranged by the contractor.

3.6. Timing changes/modification in staging and specifications

For timing changes/modification in specification etc. the Engineer shall issue instructions to the System Engineer on a form after which the System Engineer shall carry out the job and report back to the Engineer. Reconfiguration/Customization of the controller shall be a chargeable maintenance activity.

3.7. Fault Reporting System

Complaints shall be received at Depot:

By Telephone

By fax,

Or by reporting in person

The complaints shall be registered by the attendant on the log sheet.

During the working hours a complaint Number would be issued to the complaint. During none working hours on holiday's complaint would record on the answering telephone machine and number would allot on the next working day.

3.8. Records for the Engineer.

The System Engineer would regularly submit in writing to the Engineer on monthly basis the following:

Log of the complaints received

Detail of routine maintenance carried out

Detail of parts replaced if any

Schedule of routine maintenance shall be provided to the Engineer in advance in the event of damages the System Engineer will notify the Engineer through a Damage Report in quadruplicate and the Engineer will inspect the site with system engineer and will issue necessary instruction for repair/replacement on the same report.

3.9. Sequence of fault removals.

Sequence of events in removal of any fault is shown in the Flow chart.

3.10. Documents related to Maintenance

3.10.1. Daily Fault Log

This record will be kept at the UTC maintenance depot. It will contain the complaint number and location with a brief mention of the nature of complaint, reporting time, time of attendance of fault. This log will form the source document for all other documents related to Fault Call Out.

3.10.2. Yearly Maintenance Record

Master copy of this document to be kept at the Depot. She staff will have a duplicate to keep the maintenance history for each site. It contains the record of bulb replacement; faults and damages occurred during the year.

There will be a unique card for each site and information on this card will be a proof that maintenance is being carried out as per contract conditions.

3.11. Maintenance Charges.

Maintenance charges shall be invoiced on periodic basis to the Executive Engineer at the rate quoted/month by the contractor for routine maintenance which include repair of modules of phase driver cards and motherboard of the controller.

Charges for services outside the- scope of work defined above shall be invoiced separately by the contractor at the rate prevailing at the time of works done.

SPECIAL CONDITIONS

CLAUSE-I

- a) The routine maintenance include the services to be rendered for keeping the Traffic Signal Equipment in perfect running condition etc. Including repainting of poles, repair of modules of phase driver cards, mother boards of controllers, cost of bulb including replacement of spare parts. These spare parts will be kept under lock & key of the authorized representative of T&C however, separate but proper and adequate space will be provided by the contractor within the Maintenance Depot free of charge. Watch & ward of the entire Depot round the clock will be the responsibility of the Contractor. The contractor will also maintain the inventory of spare parts and will fulfill other obligations as set-forth in the TOR.
- b) Chargeable maintenance includes the supply and replacement of spare parts as and when required on the rates given in the offer. However, for all other services and works outside the scope of this agreement if desired by Executive Engineer (E/M) TRAFFIC SIGNAL UNIT TCD KMC the contractor will submit an estimate with rate analysis for the jobs to be carried out before execution and shall charge rates applicable for such jobs after obtaining the necessary approval from Executive Engineer (E/M) TRAFFIC SIGNAL UNIT.

CLAUSE-II

Any reason or cause whatsoever for non-availability of the required parts will not be entertained and the existing system will not be replaced due to this reason. This has to be assured by the contractor before awarding the contract by submitting authorization certificate from manufacturer of system.

CLAUSE-III

The contractor hereby permits the authority to make deductions from any payment to him by the authority for the work done under this contract, such sum, will amount to 10% of all money so paid. Such deductions to be held by the Authority by way of Security Deposit against the completion of work. Security Deposit so deduct shall be refunded within 3 months from the date of completion of work.

CLAUSE-IV

The maintenance of the traffic signal equipment on all junctions shall be carried out properly/promptly with all due diligence to keep all the signal equipment in perfect running condition (Un-interrupted and quality maintenance is the essence of the contract).The maintenance of the signal equipment will be carried out by the team of technician having sufficient experience and knowledge of maintenance of UTC signal equipment headed by qualified Engineer trained for the Controller installed under this project. Maintenance and fault attending in Traffic Controller will be done only in presence of the Qualified/Trained Maintenance Engineer of UTC System. In case of delay in clearance of reported fault beyond the specified time penalty/non-performance rebate, One Rebate Unit (R.U) for every 4 hours delay will be imposed on the contractor; however, the total non-performance rebate will not exceed 100 R.U per annum. One R.U =0.05% of the annual routine maintenance cost.

CLAUSE-V

The maintenance and service of the equipment will be carried out by the maintenance staff of contractor, during normal business hours, however, in emergency cases and, on special request of the Executive Engineer (E/M) of T&C. Contractor will send their maintenance staff even after the official working hours. The T & C shall furnish all information and assistance to the maintenance staff of contractor. For damage caused due to negligence of Contractor's maintenance staff, will be repaired by the Contractor free of charge.

CLAUSE-VI

In the event of any dispute or difference arising between the T & C and contractor in connection with any of the matters contained in this agreement, be settled amicably , if , however both the parties fail to arrive at an amicably settlement, such dispute or difference be referred to the two arbitrators one to be appointed by each party and the provisions of the Pakistan Arbitration Act 1940 or any re-enactment or statutory modification thereof for the time being in force shall be modification to such arbitration proceedings. The decisions of the Arbitration shall be accepted as binding upon both the parties.

CLAUSE-VII

One Hilux Vehicle owned by T.C.D. for maintenance of U.T.C. and NON-UTC system shall be maintained by the Contractor at his own cost. The Contractor will bear the operation & maintenance charges including Motor Vehicle tax & insurance charges etc of the vehicle during the period of contract. He shall return the vehicles to T.C.D. after expiry of contract period in good running condition.

CLAUSE-VIII

The T & C, KMC will pay all such maintenance, replacement or services, arising out due to outside influence such as accidents, violence, riots, strikes, storms, theft and fire.

CLAUSE-IX

- a) All Duties and Taxes (Provincial and Central Governments) will be borne by the contractor. The maintenance charges and the rates of spare parts, replacement charges are firm and no escalation due to fluctuation in market rates will be paid to the contractor during currency of this Contract Agreement.

- b) The Contractor authorizes the "Authority" to deduct Income Tax from all payment made to him, in accordance with the prevailing Income Tax Laws of Pakistan with any amendments made subsequently during the currency of the contract. The Income Tax so deducted will be deposited with the Government of Pakistan towards payment of advance Income Tax by contractor. When such deduction is made from the payments a certificate to the effect shall be issued by the Authority to the Contractor. Not with standing such deductions of advance Income Tax at source, the contractor shall be liable to pay the balance Income Tax, Super Tax and other taxes on income or his profit arising out of this contract and his employees on their remuneration etc. in accordance with the prevailing Income Tax Laws of Pakistan.

CLAUSE-X

The contractor agreement can be terminated by T & C at any time on a 30 thirty days prior notice given to the contractor. No claim whatsoever on this account will be admissible.

APPENDIX “A”

LIST OF

INTERSECTION

LIST OF TRAFFIC SIGNALS UNDER TRANSPORT & COMMUNICATION DEPARTMENT**(ZONE-II)**

S.NO	COD	NAME OF INTERSECTION
1		SHER SHAH SORI ROAD / NAWAB SIDDIQUE ALI KHAN RD / DILAWAR FIGAR ROAD (BOARD OFFICE)
2		NISHTAR ROAD / DEEPCHAND OJHA ROAD (LASBELLA)
3		NISHTAR ROAD / BRITTO ROAD (AL-BELLA)
4		BARA BOARD / MANGO PIR ROAD
5		NISHTAR ROAD / GARDEN ROAD (LOVE LANE)
6		SHER SHAH SORI ROAD / SHARAH-E-JAHANGIR (FIVE STAR CHOWRANGI)
7		SHAHRA-E-PAKISTAN / SHARAH-E-HAMAYUN (KARIMABAD)
8		JAHANGIR ROAD / CLAYTON ROAD / M.A.JINNAH ROAD / DEEPCHAND OJHA ROAD (GRUMANDIR)
9		JAMSHED ROAD / MUFTI AHMED UR REHMAN ROAD (BANORIA CHOWK)
10		CLAYTON ROAD / BRITTO ROAD (SOLDIER BAZAR)
11		M.A.JINNAH ROAD / SHAHRAH-E-QUAIDEEN / BRITTO ROAD (OLD EXHIBITION)
12		ALLAMA SHABBIR AHMED USMANI ROAD / ABUL HASSAN ISPHANI ROAD (MASKAN CHOWRANGI)
13		TARIQ ROAD / ALLAMA IQBAL ROAD (CAFÉ LIBERTY)
14		SHAHRA-E-QUAIDEEN / TARIQ ROAD (ALLAH WALLI CHOWRANGI)
15		ABUL HASSAN ISPHANI ROAD / MOULANA YOUSUF LUDHIANWI ROAD (PARADISE BAKERY)
16		ALLAMA SHABBIR AHMED USMANI ROAD / OLYMPIAN ISLAHUDDIN ROAD (DISCO BAKERY)
17		13-D RAILWAY CROSSING / SAHBA AKHTAR ROAD
18		ALAMGIR ROAD / JAMAL UDDIN AFGHANI ROAD (SHARFABAD)
19		SHAHRA-E-QUAIDEEN / KHALID BIN WALID ROAD (NOORANI KABAB)
20		SAHBA AKHTAR ROAD / SHAHRAH-E-JAHNGIR (YASEENABAD)
21		SAHBA AKHTAR ROAD / SARDAR ALI SABRI ROAD (RUB HOSPITAL)

22		SIRSYED ROAD / KHALID BIN WALEED ROAD
23		ALAMA IQBAL ROAD / KHALID BIN WALEED ROAD
24		SHAHEED MILAT ROAD / KHALID BIN WALID ROAD (MEDICARE)
25		SAHBA AKHTAR ROAD / SHAHRAH-E- AL QUDS (MOUCHI MOUR)
26		SHAHEED MILAT ROAD / TARIQ ROAD (M.CHOWRANGI)
27		RAZI ROAD / PECHS
28		ESTATE AVENUE / CENTRAL AVENUE / SHAHRAH-E-MEHDI HASSAN (GHANI CHOWRANGI)
29		SHAHRA-E-QUAIDEEN / KASHMIR ROAD (SOCITY OFFICE CWORANGI)
30		KORANGI SHAH FAISAL ROAD / AZEEM PURA ROAD (SHAMA SHOPPING SH.FAISAL COLONY)
31		KORANGI SHAH FAISAL ROAD (ABBAS BA WAZEER SH.FAISAL COLONY)
32	720	SHAREA FAISAL / RASHID MINHAS ROAD (DRIG ROAD)
33	721	SHAHRA-E-FAISAL / MILITARY GATE
34	722	SHAHRA-E-FAISAL / STAR GATE ROAD
35		RASHID MINHAS ROAD / ARMY PUBLIC SCHOOL
36		JOHAR CHOWRANGI ROAD / ABUL ASAR HAFEEZ JALHANDRI ROAD
37		NATIONAL STADIUM ROAD / PIR SIBGHATULLAH ROAD / KARSAZ ROAD
38		H.I.R ROAD / NAVY GATE
39		NATIONAL STADIUM ROAD / PIR SIBGHATULLAH ROAD (AGHA KHAN HOSPITAL)
40		SHAHEED-E-MILLAT ROAD / SIRAJ -UD-DAULA ROAD
41		SHAHEED-E-MILLAT ROAD / TIPU SULTAN ROAD
42		KORANGI CROSSING / 12000 ROAD
43		KORANGI NO-5 / 12000 ROAD
44		KORANGI NO-2 1/2 / 12000 ROAD
45		ESTATE AVENUE / ABDULLAH AHMED ROAD (SHERSHAH)
46		JINNAH AVENUE / LIAQUAT ALI KHAN ROAD (ALPINE)
47		MALIR LINK ROAD TO S.HIGHWAY / JINNAH AVENUE (TANK CHOWRANGI)

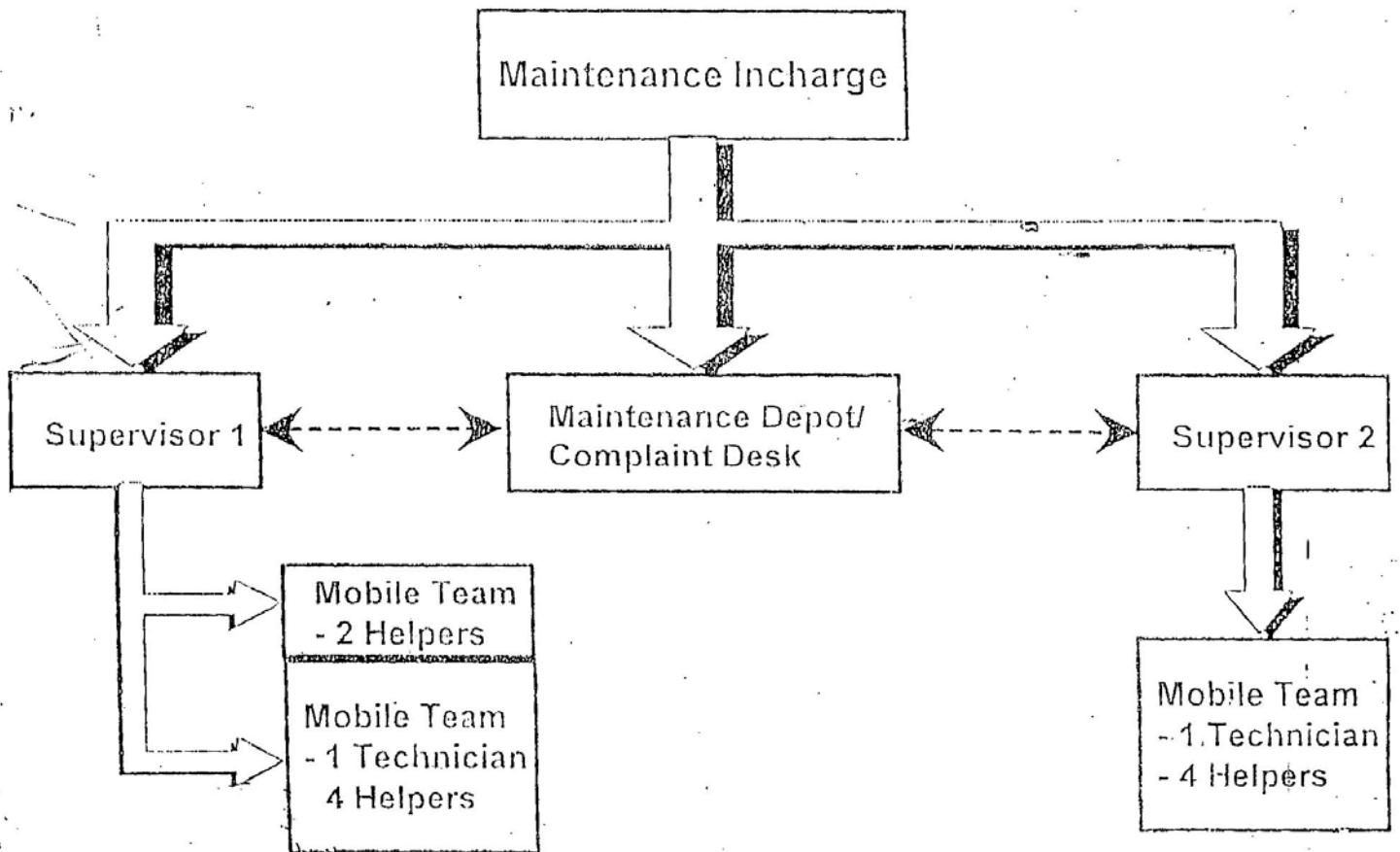
APPENDIX “B”
UTC STORE
INVENTORY

STOCK INVENTORY OF TRAFFIC SIGNALS PART IN TCD STORE

S.NO	ITEM	STOCK IN HAND
1	3-WAY ASPECT 200 MM	26
2	3-WAY ASPECT 300 MM	28
3	1-WAY ASPECT 200 MM	NIL
4	1-WAY ASPECT 300 MM	NIL
5	2-WAY ASPECT 200 MM	75
6	STANDARD POLE	144
7	MAST ARM POLE	29
8	PEDISTRIAN PUSH BUTTON	114
9	CABLE 12 CORE	250 METER
10	REGULATORY SIGN 300 MM	NIL
11	CONTROLLER T-400 (8-PHASE)	04
12	CONTROLLER T-400 (16-PHASE)	07
13	CONTROLLER CASE	NIL
14	CONTROLLER PLINTH (ST-800)	01
15	C P U T-400	NIL
16	4-PHASE DRIVER CARD	NIL
17	MANUAL PANNEL	NIL
18	HAND SET	01
19	GLASS 200 MM	NIL
20	RUBBER GASKIT 200 MM	36
21	HOOD 200 MM	NIL
22	MOUNTING BRACKET 200 MM	NIL
23	ARROW BRACKET 200 MM	NIL
24	ARROW MASK 200 MM	NIL
25	GLASS 300 MM	49
26	RUBBER GASKIT 300 MM	58
27	HOOD 300 MM	20
28	ARROW BRACKET 300 MM	NIL
29	POWER SUPPLY UNIT T-400	NIL
30	CAPACITOR	19
31	S S R	38
32	BATTERY	111
33	RELAY -A	112
34	RELAY -B	116
35	MAIN HRC FUSE	34

36	FUSE FS-7	61
37	FUSE FS-8	123
38	REGULATORY SIGN FUSE	78
39	CONFIGURE EPROM	52
40	CONFLICT EPROM	52
41	MAIN CONTROLLER SWITCH	59
42	SOCKET FOR REGULATORY SIGN FUSE	90
43	DOOR LOCK	12
44	CONTROLLER DOOR GASKIT	01
45	SCREW LOCK BOLT	34
46	SCREW LOCK NUT PLATE	50
47	REFLECTOR 200 MM	205
48	REFLECTOR 300 MM	27
49	HANGING BRACKET	NIL
50	ARROW MASK 300 MM	57
51	LOOP CABLE	NIL
52	CONTROLLER ST-800 (16-PHASE)	04
53	3-WAY ASPECT 200 MM (BLACK WITH LED BALL)	01
54	1-WAY ASPECT 200 MM (BLACK WITH LED BALL)	NIL
55	CONTROLLER S-5	03
56	3 WAY ASPECT 300 MM LED	03
57	1 WAY ASPECT 300 MM LED	02

APPENDIX “C”
MAINTENANCE
ORGANIZATION CHART



APPENDIX “D”
FORM FOR THE CHANGES REQUIRED BY
THE ENGINEER

APPENDIX “E”
DAILY FAULT LOG

DAILY FAULT LOG

S.NO.	COMPLAINT NO.:	INTERSECTION NO.	REPORTING TIME	SOURCE OF COMPLAINTS	NATURE OF FAULT	FAULT ATTENDED ON	FAULT CLEARED ON	REMARKS
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								

Notes:-

Fault Nature: L=Lamp Failure, T=Timing Changes, C=Controller, D=Damages, A=Any Other
 Complaint No. to be a four digit serial number (e.g. C0001, C0002 continued on the next date / page

APPENDIX “F”
DAMAGE REPORT

MAINTENANCE OF TRAFFIC LIGHT SIGNAL CDGK

Equipment Damage Report No _____

Name _____

Damage Occurred On: _____

Equipment And Material To Replace Or Repaired

Equipment And Material Found Damage

Work Carried Out On: _____

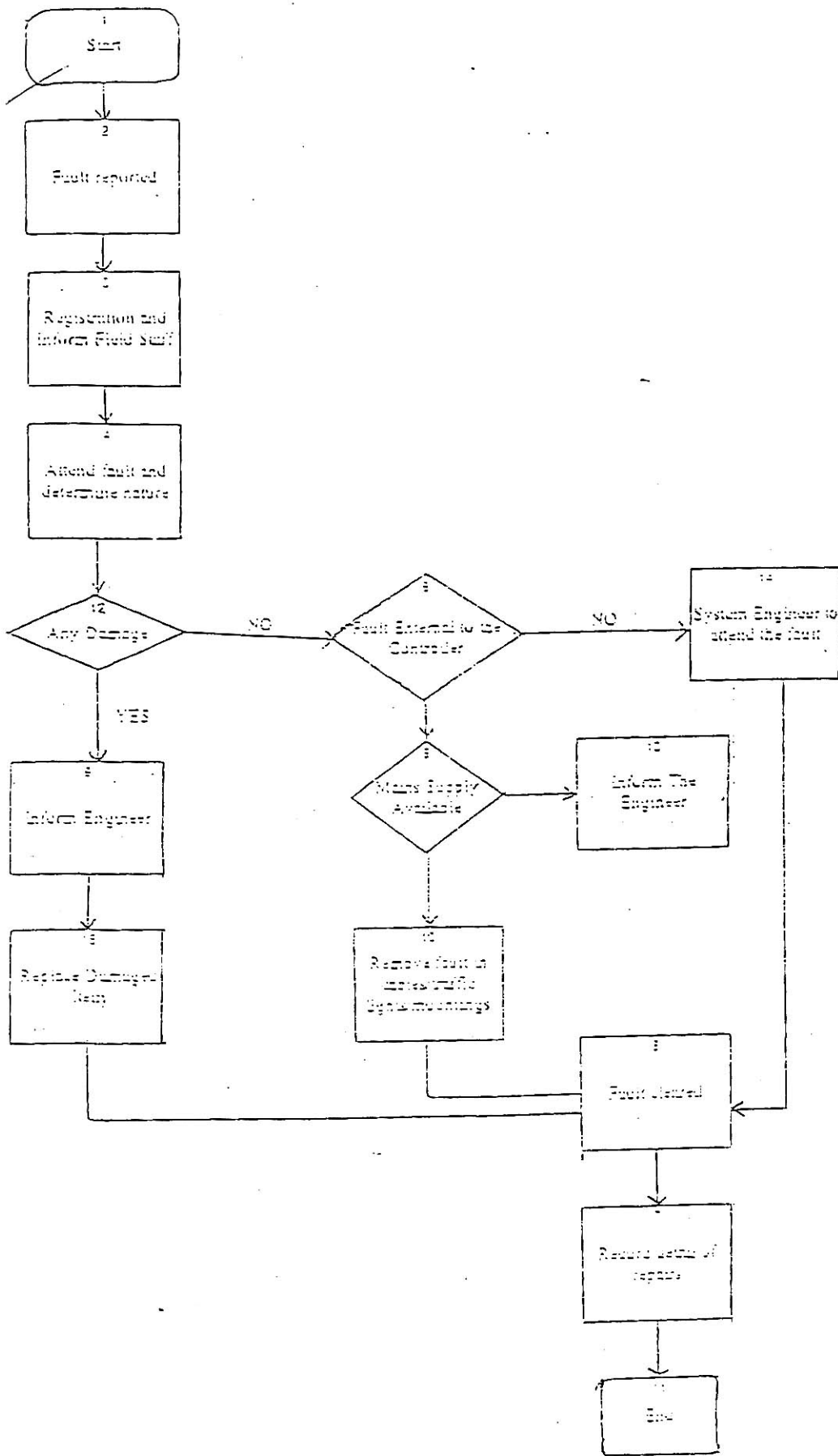
NO	BOQ NO	DISCRIPTION	QTY	BOQ RATE	TOTAL	REMARKS Needs replacement/missing	REPLACE /REPAIR	QTY	COST INCURED
		Subject to availability							

EXPECTED	
LACED	
PAIRED	Contractor/Engineer
EXPECTED	
LACED	
PAIRED	T C D Representative

Equipment be Replaced /Repaired
THE ENGINEER

COMPONENTS OF ASPECTS IN GOOD CONDITION AFTER DAMAGE		QTY
HOOD	200MM/ 300MM	
LENS	200MM/ 300MM	
GASKIT	200MM/ 300MM	
REFLECTOR	200MM/ 300MM	
1-WAY REAR HEAD BODY	200MM/ 300MM	

APPENDIX “G”
FAULT ATTENDANCE FLOW
CHART



**APPENDIX “H”
YEARLY MAINTENANCE
RECORD**

WEEKLY CLEANING OF SIGNAL HEADS.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

MONTHLY CLEANING OF SIGNAL HEADS

Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

CLF CLOCK SETTING

Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

COMPLAINT RECORD

Comp No																															
Date																															

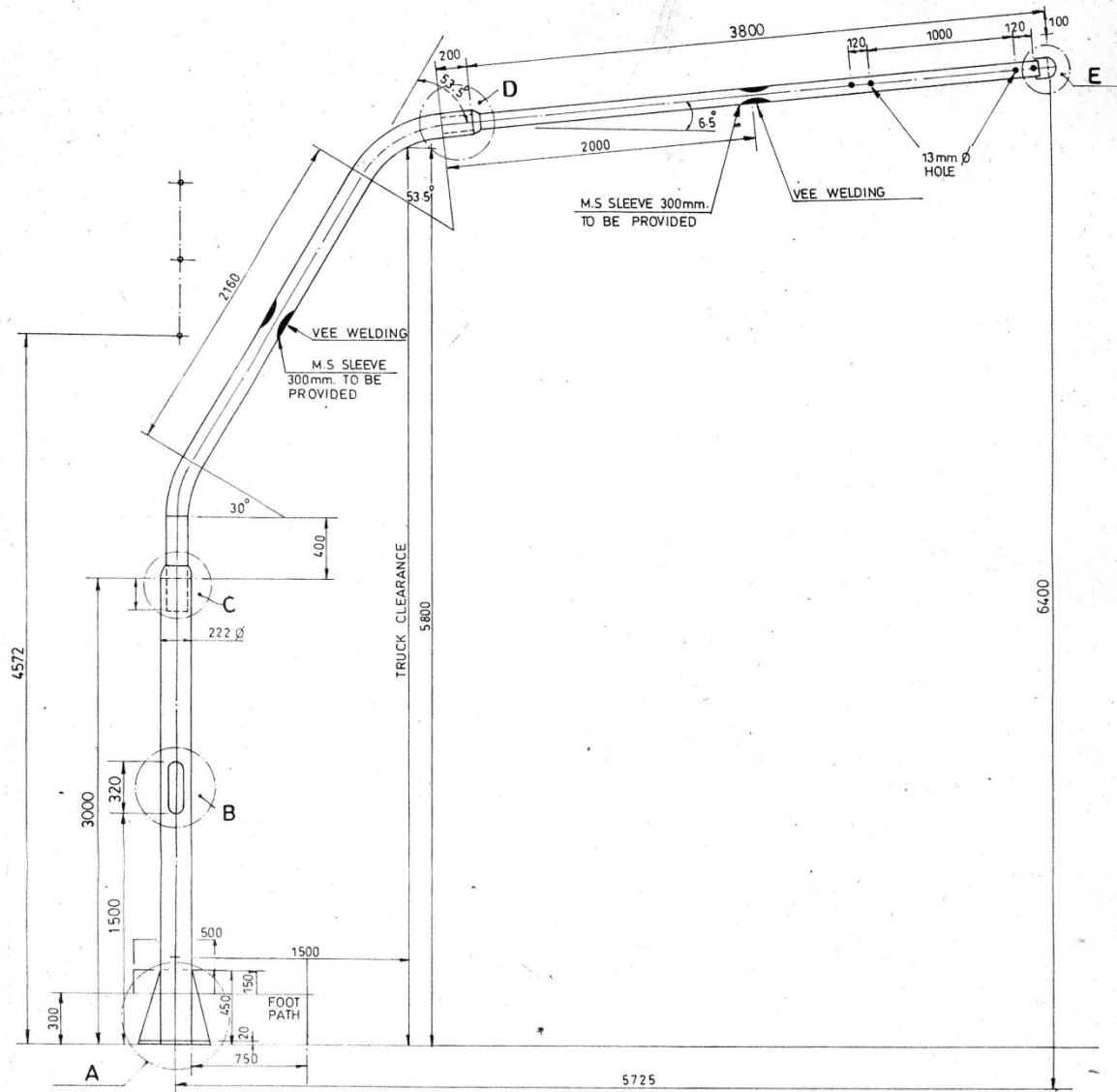
DAMAGES

Damage Rp #:		Damage Rp #:		Damage Rp #:	
Date:		Date:		Date:	
Damage Rp #:		Damage Rp #:		Damage Rp #:	
Date:		Date:		Date:	
Damage Rp #:		Damage Rp #:		Damage Rp #:	
Date:		Date:		Date:	
Damage Rp #:		Damage Rp #:		Damage Rp #:	
Date:		Date:		Date:	

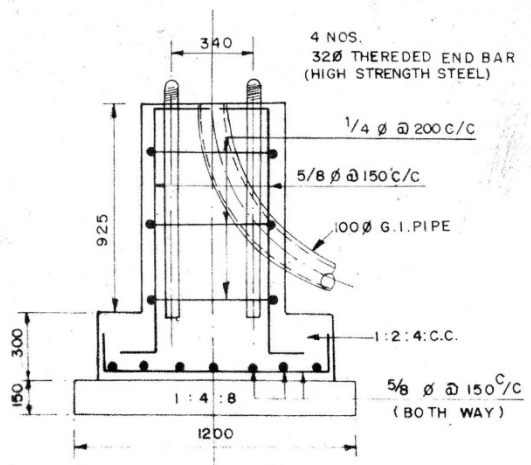
CHANGES REQUIRED BY THE ENGINEER

Sr No.		Sr No.		Sr No.	
Date:		Date:		Date:	
Sr No.		Sr No.		Sr No.	
Date:		Date:		Date:	
Sr No.		Sr No.		Sr No.	
Date:		Date:		Date:	
Sr No.		Sr No.		Sr No.	
Date:		Date:		Date:	

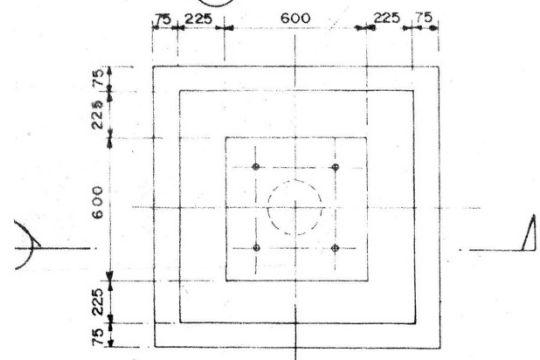
Repainting Of Signal Poles	Visual Inspection of Controller	Cable Termination Checking
First		
Second		



DETAILS OF MAST ARM POLE

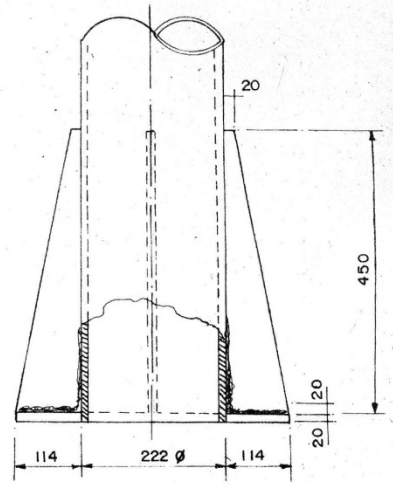


SECTION

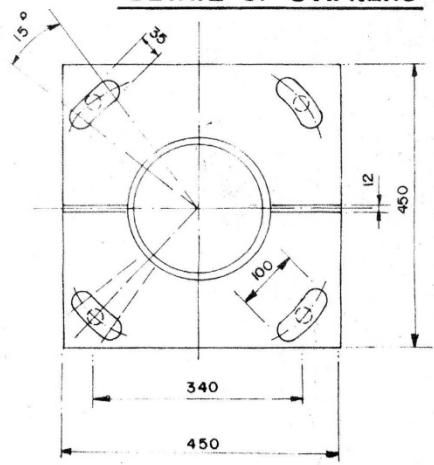


PLAN

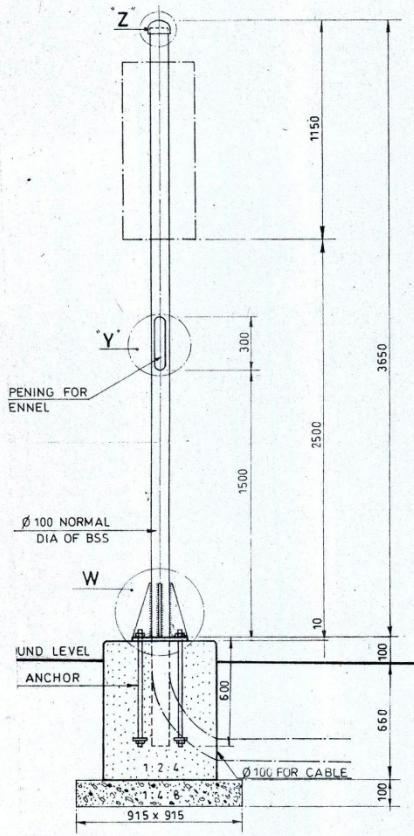
DETAILS OF FOUNDATION
(FOR MAST ARM POLE)



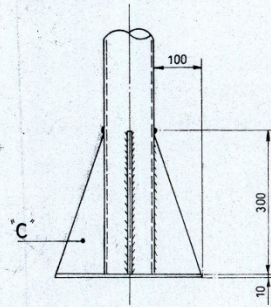
DETAIL OF STIFNERS



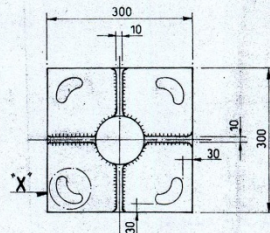
DETAIL OF BASE PLATE
(FOR MAST ARM POLE)



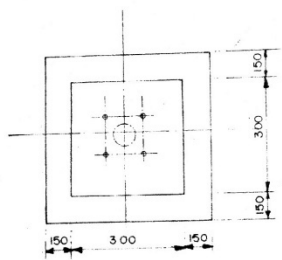
SIGNAL POLE



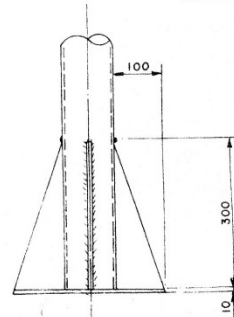
DETAIL-W



**DETAIL OF BASE PLATE
(FOR SIGNAL POLE)**

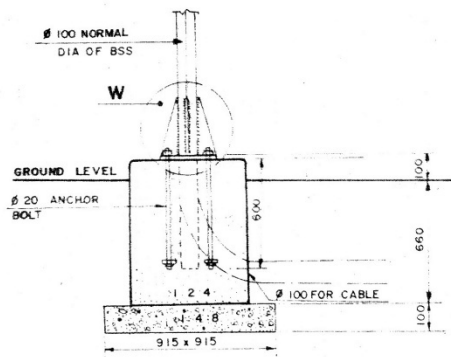


PLAN

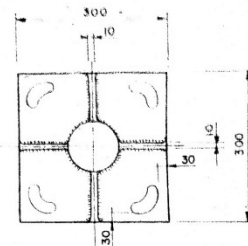


DETAIL-W

Road cons
with detail

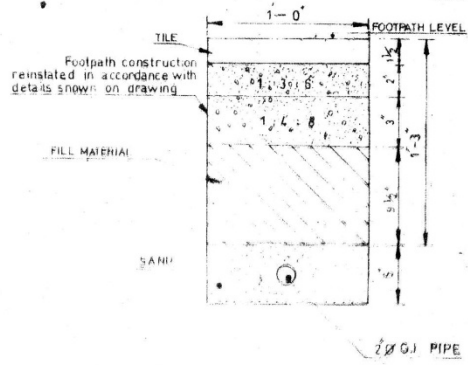
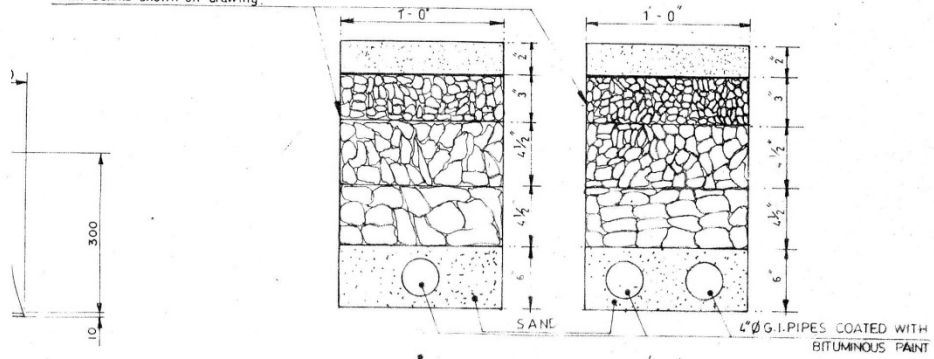


NORMAL SIGNAL POLE



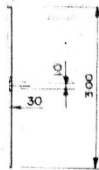
**DETAIL OF BASE PLATE
(FOR SIGNAL POLE)**

Road construction reinstated in accordance with details shown on drawing.



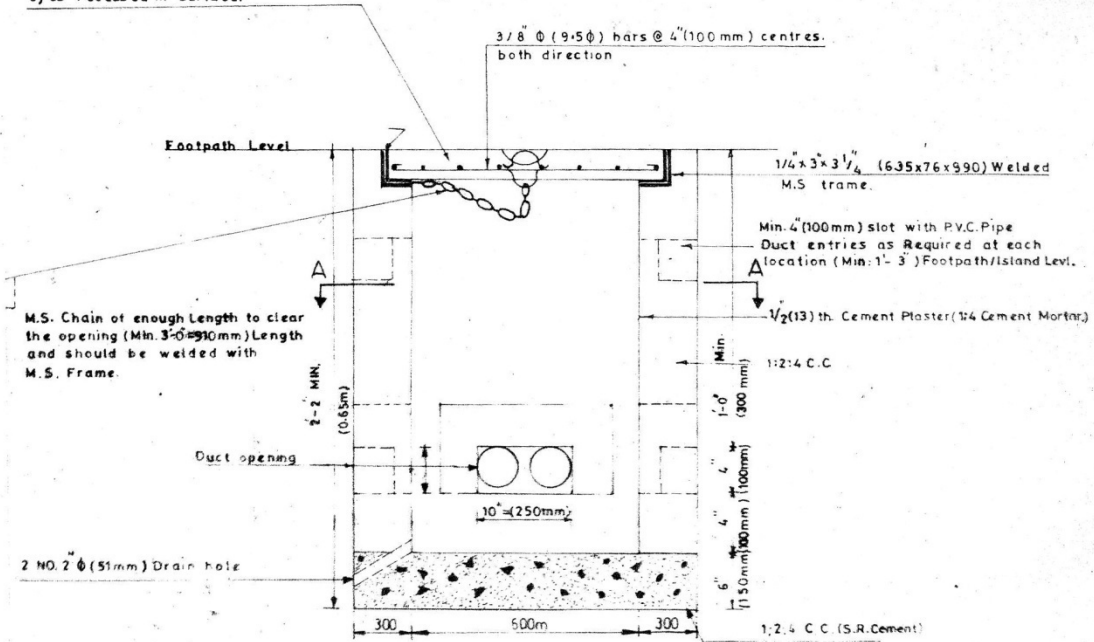
CABLE DUCT DETAIL

PLATE
(LE)



Cover 3x2-6x2-6 (76x760x760)
 R.C.C Cast in 1/4x3x3 (635x76x76) welded
 M.S. frame with 2 no. lifting
 eyes recessed in surface.

3/8" ϕ (9.5 ϕ) bars @ 4" (100 mm) centres.
 both direction



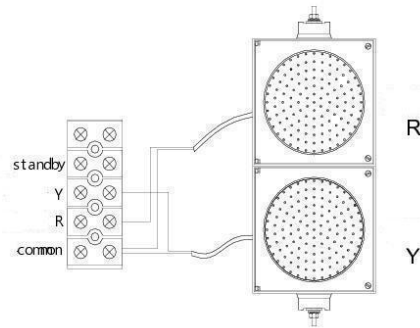
CABLE DUCT DRAW CHAMBER

300/200MM FULL BALL LED TRAFFIC LIGHTS

Model. SIEMENS TURKISH



Connection Sketch



Black : Common
 Red : Red light
 Yellow : Yellow light

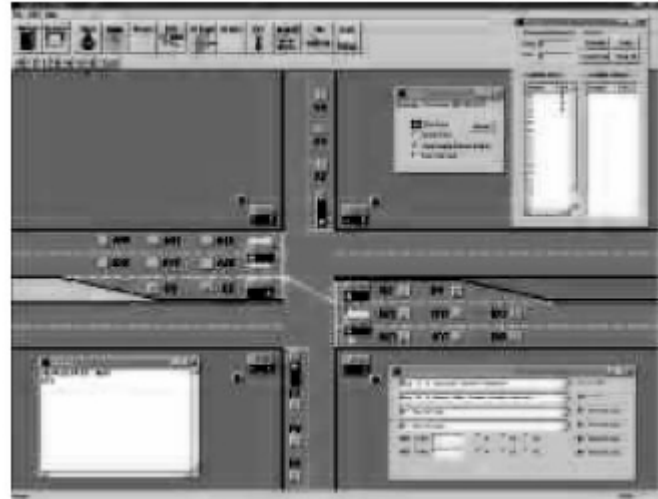
Product Photo



Product Features

- Novelty design with beautiful appearance
- Low power consumption
- High efficiency and brightness
- Large viewing angle
- Long lifespan-50,000-80,000 hours
- Multi-layer sealed and waterproof
- Exclusive optical lensing and good color uniformity
- Long viewing distance
- Keep up with CE, GB14887-2007, ITE EN12368 and relevant international standards

The ST800 is the latest high performance traffic controller from Siemens. It is designed for maximum flexibility in a wide range of applications including intersection and pedestrian traffic control. The ST800 family provides intersection, Pelican, Puffin and Toucan strategies to UK Department of Transport Specification TR221 0 and meets the essential requirements of European Specifications prEN12675 and prEN50278.



ST800 traffic controller

Modular construction

Two main construction options are available:

- **Standard outercase** - A single-sided case provides a controller logic rack and frame which swings out for ease of access. Up to 32 phases can be accommodated together with detectors and ancillary equipment including Outstation Transmission Units (OTU), Outstation Monitoring Units (OMU) and other approved items.

The outercase provides all necessary street cable terminations using CET connectors, with ample room for additional terminations and cable separation if required. Manual panel access is provided through a separately locked access door contained within the main outercase door.

- **Free-standing logic rack** - A free-standing 19 inch 6U controller rack contains all essential controller electronics within a self-contained unit. An extensive range of mounting kits is available for fitting the equipment into a variety of existing cabinets, providing a particularly cost effective route to controller modernisation.

Phase cables are supplied which can be connected to existing terminals in the host cabinet further easing the upgrade process.

A basic controller comprises a processor board offering 16 buffered inputs and a single 8-phase lamp driver board.

Expansion to a maximum of 32 phases is accomplished by the addition of up to three further lamp driver boards. Expansion I/O boards, integral OTU, and SDE/SA processor boards may be added as necessary.

The controller design follows a modular concept which means that the equipment can be supplied to match individual user specification.

Simplified installation

Installation is simplified by the modular nature of the equipment. The controller root and cabinet, complete with street cable and mains supply termination may be installed without the logic rack, which can be added at a later date.

An extensive inbuilt self-test facility which validates both the controller hardware and the street connections provides an invaluable aid to controller commissioning.

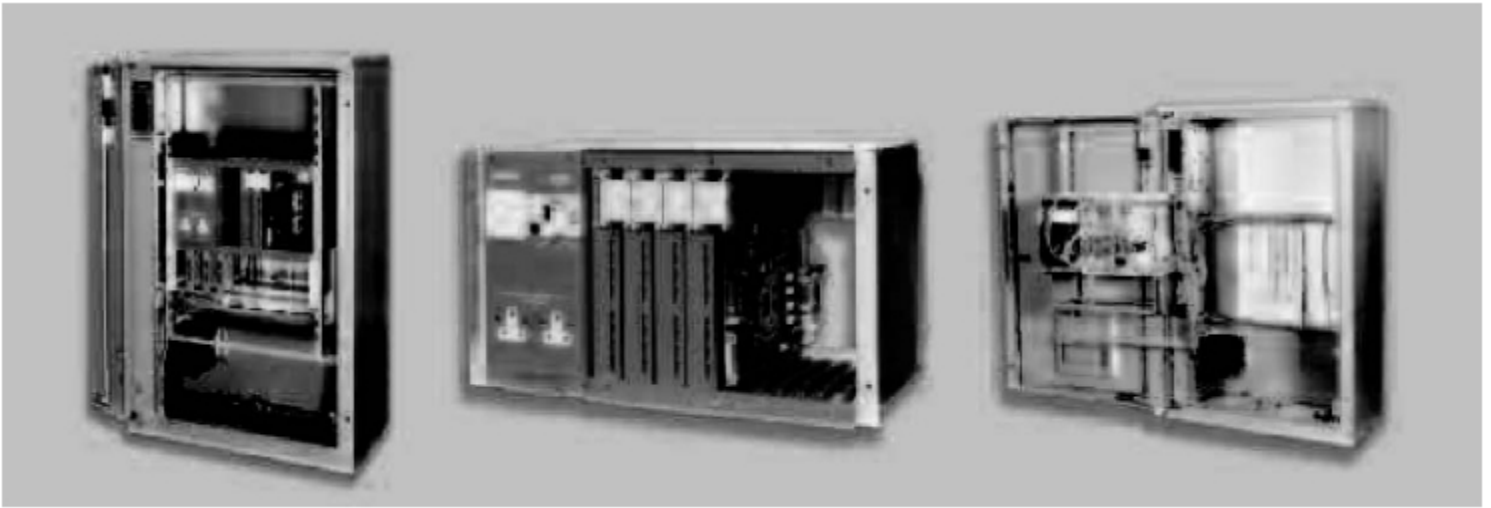
User configurable

Enhanced navigation aids and selectable levels of configuration complexity, insulate the user from controller facilities that are not being used, simplifying the configuration process.

The configuration generated by the system contains the data required to allow the controller to operate and also the IC4 source data, ensuring that it can never be lost. The data can be retrieved via the handset port in typically less than one minute and subsequently edited to create a new configuration.

Existing data for T200 and T400 controllers produced using the earlier IC3 system can be imported as the basis of new ST800 configurations, significantly easing controller upgrades. Similarly Linsig™ generated data files can be imported.

The optional emulator is a feature rich tool which links seamlessly with IC4 to provide an advanced environment for de-bugging and proving ST800 configurations. It ensures a highly accurate representation of the controller operation on a PC, using the same software source files as the controller firmware.



The IC4 Configurator provides a Windows™-based easy to use tool for generating configuration data sets for the controller. Data is entered via a series of 'forms' and is validated for correctness as part of a sophisticated error checking process.

Once configured most controller timings and many other parameters may be altered using a simple hand-held terminal. Using Siemens IC4 configurator, the changes made in this way can be easily identified and automatically incorporated into the controller configuration.

For non-UK applications the handheld terminal may be used to change more widespread parameters including number of stages and number and types of phases. This allows a single configuration PROM to be created and then quickly customised on-street.

Enhanced safety features

Two independent microprocessors and comprehensive hardware self-check features ensure an unprecedented level of controller safety. This is further improved by full equivalence monitoring on all aspect drives (red, amber, green) ensuring that mis-display of any signal colour is prevented.

For UK applications, conflicts or other major failures result in the signals being extinguished in a fail-safe manner. For non-UK use the controller also features a built-in hardware fail flash. This offers selectable 'off' or flash red/yellow for each phase, with programmable mark/space and flash rate.

Reliable facility rich software

The controller software offers many features and facilities including:

- 32 phases, 32 Stages
- 8 streams
- 8 maximum green sets
- 8 hurry calls which are in priority order
- 8 uni-directional detector loop units

- Stage ripple change facility for improved intersection capacity
- Fully configurable lamp sequences for worldwide application
- Fully integral lamp monitoring with enhanced red lamp monitoring to significantly ease configuration, commissioning and use
- Improved part-time and start-up modes, such that a stream may be sent in and out of part-time mode without affecting any others.
- Capability to provide different phase extension times on an input basis
- Enhanced CLF with plans now having up to 32 groups and the timings specified in seconds as part of the total cycle time
- Improved event timetable which supports actions based on 32 independent events and simplified programming
- Enhanced time system with full date details
- Date stamped rolling log providing detailed history of events and faults, coupled with improved presentation to aid recognition of entries
- Improved UTC mode with independent G1/G2 reply bits on a stream basis
- Enhanced handset facility running at 1200, 9600 or 19200 baud that can produce a 14 character single line display up to an 80 character by 24 line full screen status display, which displays the result of up to 10 handset commands simultaneously.

Technical specification

Modes of operation

Manual
 Vehicle Actuated
 Vehicle Actuated - Ripple
 Pedestrian Fixed Vehicle Period
 Urban Traffic Control
 Bus/Light Rail Transit
 Part Time
 Fixed Time
 Cableless Linking
 Pedestrian Vehicle Actuated
 Puffin/Toucan
 Hurry Call
 Emergency Priority

Phases and stages

No. of hardware phases	1-32
No. of software phases	0-32
Phase sequences	Programmable
No. of independent streams	8
No. of stages	32
No. of max. green periods	8
No. of phase delays	120
No. of call timers	8
No. of cancel timers	8
No. of all red extension units	7
No. of hurrycalls	8
No. of emergency/priority units	8

High speed vehicle detection

Speed discriminations	Double/triple
Speed assessment	
No. of assessors	16

Cableless linking facilities

No. of plans 16
 No. of groups per plan 32
 No. of time switch settings 64
 No. of plan influence tables 16
 No. of group influences 10
 Timing sources 50/60Hz mains
 Internal crystal
 GPS clock
 64 days
 32 holiday periods
 Holiday clock

Other facilities

Standby mode: Signals off
 or software flash
 Failure mode: Signals off
 or hardware flash

Hardware flash - selectable flash red or yellow per phase. Mark/space and flash rate selectable for whole controller.
 Signal dimming 120V, 140V, 160V
 High speed handset port 1200, 9600 and 19200 baud
 Port is auto bauding to match incoming data

Electrical

Power supply 115V -20% +15%
 230V -20% +15%
 Supply frequency 50/60Hz
 Lamp switching type Solid state
 Phases per lamp switch card 8
 Max. load per output 4A
 Max. load per lamp switch card 20A
 Max. controller lamp load 20A
 (Heavy current option available for higher lamp loads)

Environmental

Designed to meet: UK TR2210
 EU prEN1 2675
 EU prEN50278

Supply interruption:
 Continuous operation up to 50ms break
 Supply failure:
 Automatic restart without operator intervention
 Operating temperature range -25oC to +65oC

Dimensions

Standard outercase Height 1160mm
 Width 725mm
 Depth 420mm
Rack system Height 266mm
 Width 482mm
 Depth 280mm

(Rack system requires minimum 15mm clearance in front of fixing plane)

Cuckoo kits

Siemens controllers:	GEC controllers:
Siemens T70	GEC 25
Siemens T90	GEC CX
Siemens T200	GEC3000
Siemens T400	
Siemens TCUG case	
Ferranti controllers:	
Ferranti MK1 (single and double case)	
Ferranti MK2	

Signal heads for road traffic



SIEMENS

Siemens signal heads ... safe, reliable, environmentally compatible, energy-saving, attractively priced

LED signal heads

These days, LEDs are the predominant form of illumination for signal heads, having largely superseded conventional signal lamps.

This technology consumes little power, yet today's LEDs achieve top traffic signal performance.

LED signal heads with their bright evenly illuminated lights are reliably seen by road users, even in unfavorable lighting conditions, and using LEDs practically eliminates the disorienting phantom reflections that occur when the sun is very low.

The electrical interface to the controller is provided by a connection enabling LED signal heads to be operated on Siemens controllers compliant with HD 638 / DIN VDE 0832 00.

LED lights have a considerably longer lifetime than conventional signal lamps and ensure a high level of reliability of the system. Failures caused by defective signal lamps are a thing of the past.

The higher efficiency of LEDs means that their electrical power consumption is vastly reduced, so running costs for power supply are correspondingly low. LED signal heads with their low energy consumption thus represent a valuable contribution to environmental protection: saving up to 90% of the energy consumed by signal lamps

Conventional signal heads

Signal heads with conventional signal lamps are used throughout the world and can be expanded with a wide selection of individual parts and accessories.

The product portfolio includes conventional high-voltage signal heads with 230 V signal lamps. Low-voltage technology (120 V) enables your energy consumption to be significantly reduced, right down to around 20 or 30 W.

PLUS signal heads

The lamp circuits in signal heads with PLUS technology are switched decentrally in the signal heads themselves. This provides for marked reductions in the cabling outlay and in the work needed to take the units into operation. PLUS technology is available for 40 V LED and 120 V lamp designs.

- **Millions of Siemens signal heads have proven their value in everyday use.**
- **They have demonstrated their capabilities in many different countries in the most adverse weather conditions.**
- **They blend very well into any urban situation and have been awarded with the seal of "Good Industrial Design".**



Siemens signal heads ... your choice

Signal heads are classified either as LED signal heads or conventional signal heads.

Siemens offers the following LED signal heads:

- Units with 230 V technology
- Units with 40 V technology

Siemens also offers the following conventional signal heads:

- Units with high voltage 230 V technology
- Units with low voltage 0 V technology

All LED signal heads from Siemens are equipped with a central light source comprising one or more high-performance LEDs. The light is refracted by a Fresnel and diffusing lens to obtain optimum emission characteristics. The signals can be easily seen from all angles and always show an homogeneous illumination.

The luminous intensity has been optimized to achieve a high level of recognition of both signals and symbols regardless of the environmental conditions. The luminous intensity is more



wondersha

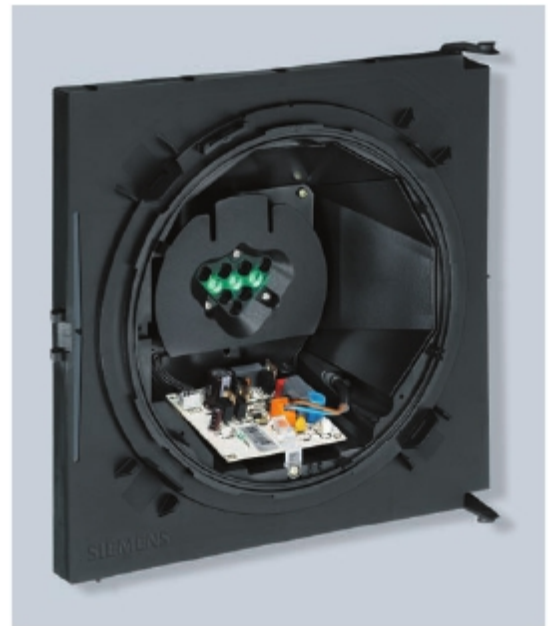
LED signal heads using 40 V technology and conventional signal heads with low voltage 0 V technology are also available as PLUS signal heads.

LED signal heads

LED signal heads have considerable advantages over conventional signal heads and are used today in practically all new systems. Thanks to their modular design, existing systems can be refitted with LED signal head technology with a minimum of effort.

The benefits of Siemens LED signal heads at a glance:

- Brilliant optical properties
- Colorless lenses eliminate phantom color effects
- Phantom class 5 (for almost all colors and sizes)
- Energy savings of up to 90% as compared to conventional signal lamps
- High level of EMC immunity
- Optimized electrical interface for SIEMENS controllers
- Significantly longer life than conventional signal lamps
- Increased availability of your traffic signal systems



than adequate, even on bright days, while at night the symbols are not so brightly illuminated as to be difficult to recognize.

Safety technology

To ensure the safety of the traffic light system, each LED light source is equipped with an electronic monitoring circuit that has been certified by the TÜV (the German safety standards authority). The current and voltage of the LEDs are continually monitored. If the forced deactivation circuit registers values indicating that illumination performance conformant to standards can no longer be assured the current at the input is interrupted, thus enabling the controller to detect the fault in the LED unit.

SILUX LED signal heads with background screen

SILUX LED insert, view of the i