

Name of formation	:	Garrison Engineer (C) Kirkee
CA No.	:	CEPZ/KKE/07 of 2015-16
Name of work	:	Provn of OTM Accn for Tech Eqpt office at BEG & Centre Kirkee.
CA Amount	:	Rs. 8,26,57,485.60
Percentage of progress	:	40%
Name of contractor	:	Shri Mohanlal Mathrani Construction Pvt Ltd
Date of commencement of work	:	10 Aug 2015
Date of completion as per CA	:	09 Aug 2017
Date of site check	:	13 Jun 2016

Brief Scope. CA No CEPZ/KKE/07 of 2015-16 : Provn of OTM Accn for Tech Eqpt Office at BEG & Centre Kirkee has been accepted by CE Pune Zone on 29 Jul 2015 for Rs. 8,26,57,485.60 with period of completion 24 (Twenty four) months from the date of handing over of site. The work includes construction of construction of bridging store 40 x 10m (02 Nos), Construction of bridging store 30 x 10m (06 Nos), Construction of FE & Cordage store/sty & ACG store/fire fighting & MES store/Sig , IT & ATG store –20 x 10M (04 Nos), Construction of timber, plywood store/tentage store/water supply store / FP & TG expandable store Gen Tool & Electric store/Cement store/OBM store/paint store/steel store of 15 x 10M (09 Nos), Construction of storage accn (01 No), Construction of R&I store 14.25 x 10M (01 No), Construction of Inspection shed of 20 x 10 M (01 No), Construction of office & Admin Accn– 22.38 x 11.72 M (01 No), Construction of Guard Rest Room of 11.90 x 7.90 M (01 No), Construction of CAR SHED WITH APPRON (02 Nos), CARS OF 7.60 X 5.93m & APPRON 5.70M IN LENGTH - 01 NO, Construction of scooter cum cycle shed of 23.30 X 6.40M with oth side ramp –01 No, Construction of static water tank 50000 Lit Cap. –01 No, Construction of sentry boxes of 1.985 X 1.66M –01 NO, Construction of fire points-05 Nos, Construction of incinerator –01 No. External Services(ROAD 600M IN LENGTH x 3.65 M wide, RCC Hume Pipe Culvert 600MM dia x 50RM & Footpath 270 RM), Sewage Disposal (210 RM OF 150MM dia RCC Pipe Class NP-3 Nos), Area Drainage(400 M X 450MM X 450MM, Security Wall 2.1 M + 0.80M, Barbed –650 RM, Steel Gate 4 M wide –2 Nos)

OBSERVATIONS ON CONTRACT AND SITE DOCUMENTS

1. **Obsn No 01 : Light fitting.** Contract was concluded on Aug 2015. As per latest E-in-C's policy issued on 2015, LED light fittings are only to be used in all new construction and in ongoing AMWP works, provision of LED light fitting is to be taken through DO. However neither LED light fitting found considered in the contract nor any action taken to initiate DO. Please forward your reply and action taken through AO for this lapse.
2. **Obsn No 02 : DG Set.** It has been observed that DG set has been catered in the contract to provide standby electric supply in CIMT area. There is no regular electric supply in the area. DG set will be used to provide regular electric supply instead of standby supply. Hence provision is not as per SOA 2009 and also it will be uneconomical. The work should be treated as special and regularization action should be taken through CFA. Forward your reply through AO.
3. **Obsn No 03 : RMC.** AS per PS clause No 5.5.1(d)(vii) " use of admixture other than mineral based fly ash/PPC (not exceeding 20%) in design mix concrete shall not be permitted". In present case as per executives RMC plant is located at a distance of 25Km from site. Time required for transporting and placing of concrete will be more than 1 hour. It is not understood how quality of concrete can be maintained without admixtures (retarders) when it is laid after more than one hour. It is practically not possible to transport concrete without admixture. As no record of slump is maintained at site there are chances that initial setting might have taken place and water could have been mixed to made concrete workable. It is bad drafting of contract and poor execution at site. You are requested to forward your comments through AO. Also intimate if any time concrete was rejected because of initial setting.

4. **Obsn No 04 :Site documents.**

- (a) Soil investigation report not produced. Kindly forward the same.
- (c) Independent test report of cement not produced.
- (d) Detailed design mix report not produced.
- (e) Cube testing report both independent & site test not produced.
- (f) Independent test on fly ash bricks not carried out.
- (g) Slump records not maintained.
- (h) Independent test report for steel not produced.

It is noticed that no sincere efforts have been made in maintaining site documents and its updation. PI carryout all requisite tests as per CA provisions and forward test reports for all building materials through AO. Accept penal recovery of Rs 10000/- for this lapse.

OBSERVATIONS ON SITE INSPECTION (MAJOR)

5. **Obsn No 05 : Fly Ash Brick Masonry.**

- (a) Poor quality fly ash bricks of size 230 x 100 x 75 mm found used in the work. Edges of bricks found broken and strength found less. No make found on bricks.
- (b) Joints of masonry found wider (20 to 40mm) and not filled properly as voids are visible. At places joints are hollow.
- (c) No proper bond (laying style) used in brick masonry, as bricks are laid haphazardly with no uniformity maintained. Bricks are laid on edges at places.
- (d) Broken pieces of bricks found filled at junction of roof beam & top of wall. Gaps found between brick pieces.
- (e) Curing found inadequate, as cement mortar is coming out easily with slight rubbing.
- (f) No testing carried out for bricks.

Please demolish all fly ash brick masonry and reconstruct with approved quality bricks using proper bond & ensure adequate curing. Intimate cost of rectification. Forward test report and your reply through CE.

6. **Obsn No 06 :Filling under Floors.** Black cotton soil not found removed completely under floor. Excavated soil consisting of expansive BC soil mixed with stone boulders/chips found used in filling under floors. No proper compaction found carried out and soil loosely filled. .Size of stone boulders found 25cm to 50cm mixed with clayey soil. Also BC soil not found removed from all round the building. This will lead to swelling/contraction in floors in addition to stagnation of water during rains. Please replace BC soil from flooring area & surrounding the building up to 3 m beyond plinth protection with approved CNS soil as per CA provisions and dispose BC soil away from the buildings. Forward the reply through CE. Please accept penal recovery of Rs 10000/- for deviating from contract specifications.

7. **Obsn No 07 : Excavation of Foundations.** In TB-II area (CIMT & Plant), excavation for soil carried out for other than expansive soil as stated by GE. No deduction carried out in payment made to contractor through RAR. Please initiate minus DO as per CA clause no 4.1.3, page 133 and confirm. Forward your reply through CE.

8. **Obsn No 08 : Steel Windows.**

(a) Steel windows of local make found provided. ISI mark & make are not marked on sections. Friction hinges found provided for window shutters. Window frames are fixed to walls using nails. On column (RCC) side no fixing provided.

(b) Gaps varying from 25mm to 50mm found all round the window frame & wall/jambs.

(c) Guard bars 9.5mm x 9.5mm in lieu 12 mm square bars found used.

The sections of steel windows measured and found less except thickness as per IS 7452. Please replace steel windows which are procured from approved manufacturer using ISI marked steel sections as per IS 7452 and IS 1038. Fixing should be carried out as per CA provisions. Also friction hinges may be replaced with box hinges to avoid maintenance problems. Rectify all defects and intimate cost.

9. **Obsn No 09 : Pressed steel chowkhat.** 1.25 mm thick MS pressed steel chowkats found fixed to walls using nails. No hold fast used. Chowkats are sounding hollow and not filled with PCC at majority of places. Please rectify defects as per CA provisions and intimate cost.

10. **Obsn No 10 : Compressive strength using NDT.** Compressive strength of RCC columns have been checked randomly using rebound hammer and values recorded 13.5N/mm², 15.5 N/mm², 17N/mm², 25N/mm², 15 N/mm², 19 N/mm² for M 25 concrete which is less than acceptance criteria. Please get the confirmatory core tests carried out from SEMT wing, CME Pune or IIT/ Govt Engineering Collage and forward results duly endorsed by Chief Engineer.

11. **Obsn No 11 :RCC Work.**

(a) RCC columns/beams found not properly casted. Columns/beam found bulged and out of alignment at places.

(b) Honey combing observed at many places and steel reinforcement exposed at many places.

(c) At places no cover maintained and reinforcement is visible from bottom of slab and is rusted.

(d) RCC Slab thickness found 75 to 100mm at edges of slabs, whereas thickness of main slab given in drawing is 140 mm.

(e) Reinforcement bars found provided at bottom level in projected cantilever chajjas at all places.

Please identify all defective areas of RCC work and rectify all defects and confirm duly intimating cost. Pl Accept a penal recovery of Rs 20,000/- for poor workmanship. Forward your reply through Chief Engineer.

12. **Obsn No 12 : Store shed (15m x 10M) TEO site.**

(a) Plinth beam provided below GL. No DPC found provided.

(b) Cover to reinforcement bars not uniformly maintained and is varying from 20 to 75 mm.

(c) RCC columns found casted with height of lift more than 2.0m. Honey combing observed at many places.

(d) Old de-shaped wooden/play wood shuttering found used. RCC columns & beams found bulged at places.

Please rectify all defects and intimate cost. Also accept a penal recovery of Rs 10,000/-

13. **Obsn No 13 :Cement Store Shed (15 x 10 M).**

- (a) RCC columns found out of alignment at junction of plinth beam level and offset found measured to the tune of 50mm (7 columns). Columns need to be demolished and re casted.
- (b) Excavated soil consisting of expansive soil mixed with stone boulders(manjri rock) found used in filling under floors.

Please rectify all defects by recasting defective columns and replacing expansive soil with approved CNS soil. Confirm along with rectification cost. Accept penal recovery of Rs 10,000/- for poor workmanship.

14. **Obsn No 14 : Bridging Store (40 x 10 M) No :2.**

- (a) External plaster found rough, undulated instead of fair and even. Evenness of plaster not maintained. Crushed stone sand in lieu of natural river sand found being used.
- (b) In internal plaster, gypsum powder is being used over the plaster when it is green in lieu of application of cement based putty without any admixture , as specified in clause 12.2 of CA.
- (d) Grooves are not uniformly cut and sizes found varying from 25 to 40 mm. Grooves are not provided at junction of dissimilar material at many places.
- (e) Cracks found developed on plastered surfaces at places.

Please rectify all defects and intimate cost. In case of non-availability of natural river sand, initiate minus DO for change in specifications and take suitable measures to obtain fair and even surface. Also accept a penal recovery of Rs 5000/-.

15. **Obsn No 15 : Plaster and Plaster grooves.** Internal cement plaster found rough & uneven in lieu of even and smooth. Wall surfaces found uneven and undulating even after application of gypsum at places. Grooves found provided at few places only where as at most of places grooves not provided. Please provide grooves uniformly and rectify other defects intimating cost.

16. **Obsn No 16 : Chicken wire mesh.** 75mm wide chicken wire mesh in lieu of 150 mm wide (75 mm on either side) having aperture 26 x 25mm, 0.4mm dia in lieu of 12mm aperture , 0.56 mm dia found used on one side of junction of dissimilar materials. At other side of junction, no chicken wire mesh provided. No chicken wire mesh found provided on external walls at junctions of dissimilar material before application of cement plaster. Please rectify the defects as specified in clause No 12.4 of CA and confirm along with the rectification cost.

17. **Obsn No 17 : R & I Store (14.25 x 10m).**

- (a) Plinth beam found provided 450 mm above GL.
- (b) Columns are out of alignment and offset found 40 to 50mm at plinth level.
- (c) No proper care found taken while casting of RCC beams, as PVC bottles and wooden pieces found embedded in concrete.

Please recast defective columns and rectify other defects. Confirm and intimate cost.

18. **Obsn No 18 : Stacking of Materials.** Building materials are not found stacked properly at site and lying haphazardly.

- (a) **Cement.** Few bags of cement of make M/S Birla Shakti, OPC 53 grade found lying in temporary tin shed measuring 3m x 3m size.

(b) Steel reinforcement bars of different size of make Balaji TM x TMT found lying on ground. Bars found rusted and cement slurry applied partially. Grade of steel not found marked on reinforced bars.

(c) **Steel windows:-** MS windows are found dumped on ground haphazardly on undulated ground.

(d) Fly ash bricks with broken edges found lying at site. It was informed that these are rejected being removed from site.

Please stack all materials properly as per CA provisions confirm and intimate cost. Accept penal recovery of Rs 5000/- for deviation from CA provisions.

19. **Obsn No 19: Site Lab.** Site lab found illequipped and housed in a small temporary Govt shed with tin sheet roof. All necessary testing equipments required for site lab for conducting specified tests not found installed by the contractor as per CA clause No 35.1.5 on SI page Nos 125. One Compressive testing machine (hand operated), slump testing instrument, sieves, MS cube moulds, weighing machine, core cutter etc found in temporary tin shed. Please ensure that the site lab is fully equipped with serviceable and calibrated equipments as per CA provisions and confirm alongwith your comments through AO. Also ensure that power operated CTM is installed for testing of compressive strength of PCC cubes and blocks. Accept penal recovery of Rs 25000/- for this lapse.

20. **Obsn No 20 : Qualified Tradesmen.** Number of ITI qualified tradesmen employed at site not found adequate as per CA clause No 36 on Ser Page No 126. The respective CA clause stipulates that the number of ITI/NICMAR/NAC qualified tradesmen shall not be less than 25% of total skilled/semi-skilled tradesmen required in each trade. Please give reasons for such deviation from CA and forward your comments through AO alongwith minus DO on this account.

21. **Obsn No 21 : Site Engineers.** Only two site engineers, as given below found deployed by contractor at site. It is observed that the site Engineers employed by the contractor are inadequate and not as per condition 25 (a) of IAFW-2249. Please elucidate why the contractor was allowed to progress the work when the adequate number of Engineers were not deployed at site and forward the recovery on account of the amount saved due to non-deployment of the qualified degreeholder Engineers as per IAFW-2249 for our perusal.

(a) Mr Kumar Mangalam, BE with 8 years experience.

(b) Mr Dashan Ashom Kumar, BE with 9 years experience.

22. **Obsn No 22 : Roof Slab.** On random checking with laser distance meter, the slope of slab found 1 in 40 in lieu of 1 in 30. Please check slopes of all buildings for requisite slope and rectify defects with padding concrete duly intimating cost.

23. **Obsn No 23 : Plinth Beam.**

(a) Plinth beam found provided below GL for majority buildings and above GL for certain buildings. No DPC found provided.

(b) On random checking in two sheds in CIMT area where PB provided below ground, it is found that no brick work is carried out above PB upto FFL. In lieu, clay mixed with stone chips found filled and no support exists to protect soil.

Please explain for variations of location of PBs in different buildings, as PB is shown in drawings below GL. DPC need to be provided wherever PB is located below GL. Rectify all defects and initiate minus DO where PB is located above GL. Forward your reply through CE.

24. **Obsn No 24 : Water.** Contractor is arranging water for building work. No tests found carried out to check the suitability of water for work. Water testing not produced. As per CA PS clause No 10.20 on page No 114, water is to be tested at least at an interval of every three months. Please forward water testing reports and intimate cost.

25. **Obsn No 25 : Cement Procured.** 8724 Nos bags of cement purchased from local dealer M/s Alok Distributor. No cement vouchers found after 10 week of 2016. None of the cement vouchers for cement procured from main producer indicate delivery at working site. Some vouchers show delivery at moshi and some at Bhavdhan area. You are requested to recover 10% cost of cement for procuring cement from local dealer instead of main producer as per PS clause No 30.1.1.2(A). You are also requested to fwd justification for place of delivery of cement at different location than site of CA. Forward your reply through AO.

26. **Obsn No 26 .** Following defects observed :-

(a) Depth of GI sunken box found 40mm in lieu of 65mm and thickness found 0.57mm in lieu of 1.63 mm. Please replace all GI sunken boxes and fwd replacement cost.

(b) PVC conduits of make 'Diamond' found used at site which is not as per the makes given in CA at PS ser No 63, page No 229. Please replace conduits as per makes given in CA and fwd replacement cost. Also the clamping of the conduits not done anywhere. Please provide proper clamping and fwd rectification cost.

(c) 1 Sqmm wire of make 'Polycab, ISI mark found used as earth wire in lieu of 1.5 Sqmm. Please replace the cable with 1.5Sqmm wire and fwd replacement cost.

27. **Obsn No 27 : Steel Tubular Poles.** Pipe of three different makes found used for steel poles. No make of pole manufacturer found on pole.

(a) J D Medium grade, ISI Mark

(b) SAI tubes, Non ISI mark

(c) APL Pipe, ISI mark MS base plate not found on poles lying at site.

A total of 205 poles have been catered for in the CA. None of the above makes has been approved in the CA PS, ser No 94, page No 231. Also the poles lying at site were without base plate. Poles should be confirming to IS 2713 as per CA, which could not be verified on ground.

Please replace all steel tubular poles and provide as per CA provisions and fwd replacement cost.

28. **Obsn No 28 : Gen Set.**

(a) 30 KVA gen set of KOEL found at CI (MT & Plant) lying on existing platform which is at ground level.

(b) Platform for DG set not constructed, Chances of water entering gen set is there.

(c) Earthing not found done.

Please rectify the following and fwd rectification cost :-

(i) Construct a proper platform.

(ii) Provide earthings with earthing pit.

(iii) Forward IEM report for testing of DG set.

29. **Obsn No 29** . Following defects are observed in Cable :-

(a) LT underground cable of make 'Glostar' was provided in lieu of 'Gloster' as per CA. Please fwd PV & TC of all cables.

(b) Size of 50sqmm, 3.5 core, 70sqmm, 3.5 core and 120sqmm, 3.5 core were found to be lesser when measured.
Please replace the cable with proper sizes and makes and fwd replacement cost.

30. **Obsn No 30 : PV & TC**. Forward PV & TC of all materials procured for work.

(Anil Mehrotra, IDSE)
SE
STE SC Pune

Appx 'B'

OBSERVATIONS ON SITE INSPECTION (MINOR)

-NIL-

(Anil Mehrotra, IDSE)
SE
STE SC Pune

IMPORTANT OBSERVATIONS

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- (b) Joints of masonry found wider (20 to 40mm) and not filled properly as voids are visible. At places joints are hollow.
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Please demolish all fly ash brick masonry and reconstruct with approved quality bricks using proper bond & ensure adequate curing. Intimate cost of rectification. Forward test report and your reply through CE.

6. **Obsn No 06 :Filling under Floors.** Black cotton soil not found removed completely under floor. Excavated soil consisting of expansive BC soil mixed with stone boulders/chips found used in filling under floors. No proper compaction found carried out and soil loosely filled. Size of stone boulders found 25cm to 50cm mixed with clayey soil. Also BC soil not found removed from all round the building. This will lead to swelling/contraction in floors in addition to stagnation of water during rains. Please replace BC soil from flooring area & surrounding the building up to 3 m beyond plinth protection with approved CNS soil as per CA provisions and dispose BC soil away from the buildings. Forward the reply through CE. Please accept penal recovery of Rs 10000/- for deviating from contract specifications.

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11. **Obsn No 12 : Store shed (15m x 10M) TEO site.**

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(Anil Mehrotra, IDSE)
SE
STE SC Pune