

TYPICAL ERRORS AND OMISSIONS COMMITTED BY SITE ENGINEERS

Introduction

The Oxford dictionary defines the Engineer as one who designs, builds or maintains engines, machines or Structures.

In a nutshell, both the designer and the executor of the scheme requires a high level of commitment and devotion to the Job. Whereas the former estimates all probable loading to which the structure is likely to be subjected to in it's service life, evolve a scheme that intricately fashion out modalities for safely sustaining working loads and ultimately spread same on the soil in a manner devoid of problems, the disposition of the Site Engineer alongside the team on site would determine the fate of entire exercise.

We got the job! What next?

With the job won and project team constituted, work begins with intricate study of the project documents in the order listed below:

Ensure all listed documents are duly marked "for Construction purposes

Ensure Bending Schedule pages has been served with relevant Shape Code

Review Structural drawings; starting with the general notes in order to be well acquainted with terminologies, detail description of modalities to be adopted in earthworks, Acceptable material yield stresses -i.e., Concrete cubes and reinforcement steel, timber treatment and handling procedures, Block wall: maximum stack height, et al.

Go through individual drawing and assess level of buildability -ease of construction and appropriateness of dimensioning.

Arrange visit to the site and mark out core operational area -work men shed and the batching area. Cast concrete platform to 1% slope and ensure at least 150mm elevation above ground level. This will forestall aggregates being contaminated by natural soil alongside other impurities in the immediate vicinity.

Pay close attention to terrain -slope, outcrop, craters and evidence of dredging and other human activities in time past.

Likelihood of natural water body close by. Ascertain level of site above sea level and study surrounding properties for records of tidal heights.

Decide promptly on sourcing water for the works; ensure ground water on site -in bore hole, is tested for portability and adjudged safe for the works.

Make trial cubes from probable sand samples and crush same to firm-up on appropriate mix proportions / WC (water cement ratios)

Request for services drawings and study same. Watch out for likely conflict areas; most especially as it impacts on structural elements and raise alarm immediately.

Notwithstanding subsisting contractual agreements, all energy must be deployed to executing the works in its entirety. Otherwise, sub-contractors in-efficiencies would mar the project badly. Quite interestingly, no one frowns at seeking clarifications

Building Setting out / Pile Cap positioning:

With the job won and project team constituted, work begins with intricate study of the project documents in the order listed below:

Conventional building setting out via tie-lines and 3x4x5 triangulation at corners has proved in-effective and erroneous in today's construction.

Pile points are being established via GPS -Global positioning system, this ensures concise position of building and horizontal rotation on plan.

Deploying option 1 rather than following up on option 2 is tantamount to risking collapse has column points are far removed from pile positions

Haphazardness in column positioning dead in centre of pile group.

Material Stacking and Handling:

Indiscriminate tipping of aggregate on the ground

Dropping off steel reinforcing rods on the bare ground

Allowing oil spill and grease on aggregates and iron rods

Not paying ample attention to the cleanliness of trucks used in transportation.

Overlooking silt balls and other contaminants in aggregates

Slump test meant to regulate consistency of mix no longer in vogue.

Optimizing bar stock length at the expense of specified cut length in Bar bending Schedule.
This compromises tension lap and anchorage and as such, undermines integrity of structure
Jettisoning specified shape for more convenient straight bars often results in congestion at bar lap position.

Ceaselessly folding and un-folding rebars,

Carelessness in mixing, transporting and handling of Concrete. It is disturbing to see people mixing concrete with water drawn from public drains,

Haphazardness in deploying concrete spacers to the works,

In-adequate compaction of concrete,

Not paying enough attention to formwork -erection, bracing and removal,

Top level of formworks not ascertained prior to casting.,

In-appropriateness of concrete curing -procedure and duration.

Project Administration:

Lack of know how -i.e., in-depth understanding of work procedures has subjugated Engineers to trade men,

Deficiencies in scheduling and basic project management skill,

Lack of sense of ownership and Accountability. No check list, no feedback on task allotted,

Absence of project daily work schedule discussion with trades men. Interestingly, on a project in which I was resident for ~2.5 years, I witnessed tremendous positivity in progress. All this entails is 15 – 20mins chat between Project manager, Engineers and Foremen; afterwards, foremen meet with gang leaders and relate agreed timeliness with Artisans. The feeling of joint ownership in decision making fostered progress rather than the kick and follow approach,

Civil work management mentality rather than “project manager”,

Poor interpersonal relationship with sub-contractor. Timely understanding of methodology to be deployed in job execution and offering advice cum assistance would curb needless infractions. Effective job management is rooted in firmness and friendliness,

Resorting to self-help rather than seeking clarifications from necessary parties.

Final word:

An effective project administrator is:

Teachable and open to advice

Accountable

Responsible

Is driven by ownership mentality rather than employee spirit

Above all, has empathy for the job owner; “satisfaction of our clients”, must be the minimum yardstick for gauging successful project execution.