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Who Resolves the Problems on a Construction Project?

A Resident Engineer's Viewpoint

In our construction industry, every day we find problems that we must solve. It is the Resident Engineer's responsibility to insure that a correct, and timely solution is found each and every time a problem arises, or the administration of a construction project will fail. Such a breakdown will cause an owner, and construction contractor, unwarranted aggravation, as well as unnecessary expense. Construction projects operate on two fundamental factors: time and money. It is up to the Resident Engineer to keep the contractor's schedule rolling, and at the same time undauntedly insist that the project be built in accordance with the contract provisions. It is also his or her charge to recognize when the provisions of a contract are not desirable or practical, or simply do not work, and to expeditiously provide the contractor with a proper change acceptable to the owner.

Since a large number of movable structures projects are built by governmental agencies, it is recognized that within these agencies there exist experienced engineers with many different specialties. A Resident Engineer cannot be expected to be a specialist, in the true sense of the word in all areas, as the makings of a movable structures construction project has a multitude of distinctly different disciplines which comprise it as a whole. When a problem becomes apparent, and it is of such a nature that is outside of the Resident's expertise, he or she must closely listen to a specialist's opinion or position, and make an appropriate decision. The Resident Engineer is at the

focal point of the contractual relationship between the owner, and the construction contractor. He or she is the team leader for the owner's representatives.

Even a good Resident Engineer cannot be successful in the proper administration of a construction project without a qualified, and experienced team of subordinate field personnel. The Project Engineer is the Resident's second in command. He or she has a key position on the project as the field engineer in charge. This individual must be able to make independent decisions, and give the contractor guidance on the resolution of day to day field problems. The Project Engineer must keep the Resident abreast of the progress of the project. A capable Office Engineer is also an essential element of a project staff, especially on larger size projects. He or she is the Resident Engineer's office record keeper; handles paying the contractor his monthly draw, and prepares the project final payment estimate. Qualified construction inspectors are also an asset to a project field office, and in this writer's opinion, they can be hard to find at times. These are the people that usually are coming up the ladder of a construction engineering group, and they are seeking their own personal success more actively than those in higher positions. Nurture the good ones.

This latter paragraph is meant to show the importance of position in a field office from the Resident Engineer down, regarding construction engineering, and inspection. There is a large branch stemming directly from the Resident Engineer, which is office support. This is his Clerk Typist, Secretary, Senior Secretary, and Office Manager. The exact need for all of these positions will

differ, depending on the requirements of the project. The importance of these functions within a Resident's office are, without a doubt, critical. These people are equally as important to the successful running of a construction field office as any other factor.

It is also recognized that the construction firms themselves that build these movable structures projects have within their own forces experienced people. The Resident Engineer must always coordinate problem solving with the contractor, as obviously they are the organization performing the work. At times, the Resident Engineer will go with the contractor's decision on remedying a concern, especially if the contractor has found a better way of handling the situation. It must be understood that the Resident Engineer always has it in his or her mind that contractors are time and money oriented, and the solution to a discrepancy must be quality based, and secondarily time and money based.

The Engineer of Record (the Designer) must also provide resolutions to problems, though their input is normally limited to correcting errors or omissions in their construction plans. They do though make decisions during the shop drawing review process. There are times when the Resident Engineer will consult with the Engineer of Record, even when a problem is not of their making. The reason being is that their opinion, and experience is also respected.

At this time, I would like to show you, for example, the plan of action taken to resolve an actual field problem on my present project. The time frame of writing this paper is May, 1990. The issue I am about to tell you is of a complex nature that has required all of the resources available to the Florida

Department of Transportation (the Owner), and the contractor. The project involves the construction of twin movable bridges, each having two leaves. Each leaf is driven by rack and pinion gears with one central speed reducer unit. The northeast gear box has failed, leaving that leaf inoperable. It was found that the input shaft gear teeth, and the teeth on the first reduction gear in the speed reducer unit had stripped only two years after opening the bridge to traffic. The same condition of premature wear has also been found in the same gears of the other three gear boxes, though they have not failed.

As Resident Engineer on the project, it is my job to oversee the orderly resolution of the gear problem, and to see to it that the cause of the failure is found, and corrected.

The construction contract required that a load test be performed on the speed reducer units, and that test was never done. The testing is scheduled to take place in the near future. The contractor contends that if the boxes pass the test, then they have fulfilled their contractual obligation in completing the contract, and whatever problem is left is not their responsibility. We do not accept that position, as the mode of failure must be determined, and the problem eliminated, before any acceptance of the project takes place.

The Florida Department of Transportation has retained a metallurgical consultant, and another consultant who is a recognized expert in gear systems. The contractor has also hired a gear expert to represent their interest. Every day, decisions are made by all parties concerned as to our continued efforts to rectify a difficult situation.

The contractor has developed a schedule for the testing, re-building, and re-installation of the gear boxes which is acceptable to the FDOT at this time. They are considered proceeding at their own risk presently, as the mode of failure has not been found. The gear experts are working on the problem separately, though cooperatively. The metallurgical consultant will be performing testing on the failed gears. Information will be pooled and analyzed, and a determination as to a final resolution of the gear problem will be made.

As the focal point, I communicate with these different interests every day to insure that everyone agrees with the next problem solving step to be taken, and that the progress of this effort runs smoothly, and is timely. To date, we are still working at finding the flaw, and we have made good progress, and the end is near.

A quality project is built by an experienced, and conscientious contractor, caring engineers, and aided by thorough, and adequate contract provisions. All of the enumerable decisions that build a project are made by the efforts of all interests concerned. The Resident Engineer must make sure that no problem has been left unsolved before the owner accepts a project. All of the parties involved should genuinely care that the project is built to the highest possible standards.