



A Pioneering Scaffold For Employ Reinforce Slab Mixture

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Abstract: Within this project, we view and studied completely some utilizes a site associated with publish tensioned slabs. The different sizes of tendons available, what are materials imparting prestress towards the structure were studied completely. We've also understood and performed building column line staking on-site. The tendons are specified by the forms in compliance with installation sketches that indicate the way they should be spaced, what their profile ought to be where they should be stressed. Following the concrete is positioned and it has arrived at its needed strength, usually about 75% of their final strength, then your prestressing process begins. The key is the fact that once the tendons are extended, want revisit their original length but they are avoided from doing this through the anchorages. The truth that the tendons are stored inside a permanently stressed condition leads to a compressive pressure to do something around the concrete. This considerably boosts the load-transporting capacity from the concrete. Since publish-tensioned concrete is cast in position in the job site, there's very little limit towards the shapes that may be created. Curved facades, arches and complex slab edge layouts are frequently a trademark of publish-tensioned concrete structures. Publish tensioning is just evolving increasingly more with growing innovation of creative and atmosphere friendly materials. An essential aspect to become stored in your mind may be the sustainability. Publish tensioned concrete has a lot of advantages in comparison with conventional RCC construction, probably the most important to be the decrease in self weight and overall decrease in the advantages of materials.

Keywords: Post Tensioned Slabs; Tendons; Concrete; Curved Facades;

I. INTRODUCTION

Your building suggested is on the site by having a section of 70,500 sq foot. And it is a couple basement G+5 building. Prestressed concrete is essentially concrete by which internal stresses of the appropriate magnitude and distribution are introduced so the stresses caused by exterior loads are counteracted to some preferred degree. In Reinforced Concrete people, the prestress is generally created by tensioning the steel reinforcement. The first types of wooden barrel construction by pressure fitting of metal bands and shrink fitting of metal tires on wooden wheels indicate that the skill of prestressing continues to be practiced from ancient occasions. The tensile strength of plain concrete is just a fraction of their compressive strength and also the problem from it being deficient in tensile strength seems to possess been the driving element in the introduction of the composite material referred to as "Reinforced Concrete". The introduction of early cracks in reinforced concrete because of incompatibility within the strains of steel and concrete was possibly the beginning reason for the introduction of a brand new material like "prestressed concrete" [1]. The use of permanent compressive stress to some material like concrete, that is strong in compression but weak in tension, boosts the apparent tensile strength of this material, since the subsequent use of tensile stress must first nullify

the compressive prestress. Materials in prestressing are: High strength concrete and tensile steel.

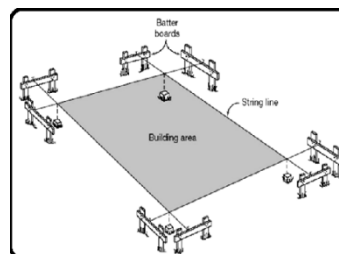


Fig.1. Building staking

II. PRELIMINARY WORKS AT SITE

To make sure that correct materials are provided and used, specific qc procedures for material acceptance ought to be in position. Procedures may vary from Condition to Condition or from Owner to Owner. In some instances, the owner may need that just publish-tensioning systems be utilized which have been approved and pre-qualified underneath the Proprietors qualification program. Prequalification in this way involves prior submission and approval of test reports and certifications. All bars of every size from each mill heat of steel and all sorts of strands from each manufactured reel to become transported to the website ought to be assigned a person lot number and become tagged in a fashion that each such LOT could be precisely identified to begin. All unknown prestressing steel (strand or bar) or lack of positive

evidence of identification is actually rejection. Following initial acceptance, the consumer from the prestressing steel (Contractor) should maintain good control of storage and identification, maintain records and offer copies of certifications and test leads to the inspector (CEI). Costs of acceptance and qc exams are typically incorporated within the project bid products for post tensioning work with no separate payment is created. Testing should comply with the relevant ASTM Specifications. The place that the publish-tensioning will be installed is the "site" and could be the project site or perhaps a casting yard. Duct: Key features for acceptance for internal tendons are: Duct cast into concrete should withstand a minimum of 3.0M (10ft.) of concrete fluid pressure. Duct shall not dent greater than 3mm (1/8 inch) within concentrated pressure of .45KN (100lbf) applied utilizing a 13mm diameter reinforcing bar. Where prestressing steel is pre-set up in the duct, the duct shall withstand a minimum of 1.5 M (5 foot.) of concrete fluid pressure and potential to deal with denting isn't needed. Duct having a diameter more than 50mm (2 in.) shall not deflect greater than 75mm (3 in.) whenever a 6M (20ft.) length is supported at its ends, although where tight radii are needed, more flexible duct might be allowed. Plastic duct should withstand the above mentioned at 38°C (100°F) with the exception that longitudinal stiffness needs might be reduced by 50% when the installation support spacing is reduced 50% from that for steel duct. Site Cleaning: Strip Site of Organics & Trash: The website ought to be initially stripped of surface plant life along with other unhealthy material. Recompact Scarified Surface Material: The uncovered sub grade ought to be scarified and recomputed. Identify Voids & Recompact: Remove trees, such as the root system. Proof rolls the website to recognize any loose soil. Drainage: Grade all for positive drainage from the foundation after and during construction. Compaction tests ought to be performed on all fill materials throughout the site development phase. The standard, along with the compaction, of fill material ought to be documented. Fill should exhibit low expansion qualities, be free from organics along with other unhealthy material, and become suitable for the present soil characteristics. Building Column line staking (subtopic): Building column line staking is an essential part of setting up a building. It helps to ensure that the dwelling that will be built is made within the correct place which the posts are put wherever these were made to go. Any kind of construction staking is completed particularly by professional land surveyors to make certain that enhancements are made within the right area in line with the site plan and engineering plans. Ultimately the surveyor uses structural or architectural intends to mark in which the posts along with other features is going to be built,

,marks the scale and sizes after which enables the development crew to construct the enhancements in the location without worry of whether things come in the best place or otherwise.

III. THE DESIGN PROCESS

This views the different stages from the design process. As with most reinforced and prestressed concrete design work, the customary design process is of the iterative nature following a cycle: Preliminary design, Check design by analysis, Revise design as needed, Repeat steps 2 & 3. Case study is generally according to semi-empirical procedures like the equivalent frame method. More rigorous analyses according to, for instance, finite element methods are hardly ever adopted [2]. They ought to simply be considered for big projects of surprising form in which the high design costs and also the inapplicability from the empirical method justify them. Fundamental analysis: Case study of publish-tensioned floor systems is different from a reinforced concrete design approach because of the positive effect the tendons dress in the dwelling. In RCC, the reinforcement is initially unstressed the strain within the reinforcement is a result of the deformation and cracking from the structure under applied load. However, the tendons inside a publish-tensioned floor are positively stressed through the jacks so they are loaded before the use of other loads. The pressure within the tendon is selected through the designer and doesn't vary much with the use of serviceability Limit condition dead and live loads. Case study of equivalent frames might be carried out by hands, using moment distribution or versatility methods or by computer using plane frame analysis programs. There's also in the marketplace several software specifically written for publish tensioned flooring system. These programs not just undertake the research into the frame under applied loading and loading in the tendons, but additionally calculate the flexural stresses. Structural layout: This was already discussed. It is an essential decision within the design process. Unless of course previous experience or higher riding factors dictate the precise form & section, several options ought to be studied even though the designer will be able to limit the potential solutions by thinking about the different constraints by rough design and costing exercises. Loading: The loading for serviceability Limit Condition should think about the dead load and publish-tensioning effects acting with individuals mixtures of live loads which lead to maximum stresses. At change in prestressing just the dead loads present during stressing, along with the publish-tensioning effects before losses because of creep, shrinkage and relaxation should be thought about in acquiring stresses. In which the applied loads change considerably during construction or phased stressing is utilized, the

different stages should each be looked into for transfer stress limits. Equivalent Frame Analysis: It's usual to split the dwelling into sub-frame elements in every direction. Each frame usually comprises one type of posts along with beam/slab aspects of one bay width. The frames selected for analysis should cover all of the element kinds of the entire structure. Using the same frame method doesn't take account of these two-dimensional elastic load distribution effects instantly [3]. It'll give different support reactions in the analyses within the two orthogonal directions unless of course the width of slab is going to be full panel width. Tendon Profile & balanced Load: Ideally the tendon profile is a will create a bending moment diagram of comparable shape, but opposite sign, towards the moments in the applied loads. This isn't always possible due to different loading conditions and geometric limitations. It ought to be noted that for glued systems the centric from the strands won't coincide with centric from the duct. Many of the true within the situation of circular ducts. Within the simplest situation, for any uniformly loaded simply-supported beam, the bending moment is parabolic, as is the perfect tendon profile. The entire 'sag' within the parabola is called the tendon 'drape' and it is restricted to the section depth and minimum cover towards the tendon 'drape' & is restricted through the section depth and minimum cover towards the tendon. In the props up tendon doesn't have eccentricity and therefore there's no bending moment because of the tendon forces. The upward forces put on the concrete with a parabolic profiled tendon are uniformly distributed across the tendon. In the ends from the tendon downward forces are put on the concrete through the anchorages. The upward & downward forces have been in equilibrium, to ensure that no exterior forces occur. The group of forces put on the member through the tendon are classified as 'equivalent' or 'balanced loads' for the reason that the upward forces counter-balance a proportion from the downward forces because of dead and live loads.

IV. EXECUTION

All the materials should be ready at the site. Everything will be brought on day one of execution except Concrete. Concrete will come in Ready Mix trucks on the day of pouring concrete into the reinforcement. The main materials: High grade Concrete, Steel Fe 450, Fe 415 (8 ϕ , 10 ϕ , 12 ϕ , 16 ϕ), Ducts for tendons, Tendons (Mono strand, 3 strand, 5 strands). The chairs must be ready for profiling the tendons and supporting them. . Following this, the anchorage markings are created. Machinery utilized in publish tensioning slabs: Machinery utilized in publish tensioning could be classified into two groups:-Installation equipments, Pumping equipments. Installation equipments are

utilized to induce prestressing pressure. They're further considered: - Mono strand stressing jacks and Multi strand stressing jacks. Pump equipments: Pumps utilized in the publish tensioning of slabs are listed below: - Stressing pump, Grouting pump, Vacuum pump, Strand pushing machine, Extrusion jack, Bond finish machine. Anchorage markings: The constituents from the stressing anchorages would be the anchorage body from the cast steel using the wedges, a poly ethylene sealing sleeve and also the recess former. The prestressing pressure is used in the concrete with the anchorage only. Lounging of tendons: The handling and installing of the publish-tensioning tendons does require special skill and understanding. In elevated slab construction, the tendons typically are categorized in bundles to be able to boost the spacing between tendons and enhance the constructability from the slab. Lounging of nominal reinforcement: The reinforcement arrangement starts with lounging from the united nations tensioned reinforcement. The nominal reinforcement works as a base for those tendons. Nominal reinforcement will get 8mm and 10mm bars. Heavy reinforcement is supplied close to the posts with rods of 16mm and 12mm dia. Bursting reinforcement: Reinforcement is generally needed to face up to the tensile stresses brought on by the power of the pressure applied in the anchors. Concrete flowing: Tests were conducted on M35 to offer the most effective design mix [4]. With the IS approach to mix design, proportions were got along with the same proportions, cubes were prepared after which tested for that compressive strength in the finish of 4 weeks. Mix Design: Concrete mix design may be the science of deciding relative proportions of ingredients of concrete, to offer the preferred qualities within the most cost effective way. It ought to be borne in your mind that mix design when adopted at site ought to be implemented with proper understanding with necessary safeguards. Prestressing: Concrete remains to harden for any couple of days, nearly seven days in order that it achieves its preferred strength at seven days. M35 gains strength of approximately 25 N/mm² in the finish of seven days which is at this time, the prestressing is completed. This arrangement remains for twenty-four hrs and subsequently day, it will be checked or no anchorage slip has happened. If so, prestress should be applied again. Otherwise, the anchorage portion is locked (with cement paste) and so the extra part of steel protruding out is stop. Grouting: After a couple of days from the completed prestressing process, grouting is completed for those tendons. The main and the most crucial reason behind grouting to become done would be to support the prestress. Another essential reason would be to safeguard them from corrosion by filling all of the spaces within the provided duct.

This completes the entire process of lounging from the publish tensioned slab. The slab will be exposed to curing for around 5-6 days after which left to harden. In the finish of 4 weeks, its compressive strength might be checked with any appropriate equipment [5]. Other qualities might as well be looked into.



Fig.2. Concrete pouring

V. CONCLUSION

Prestressed concrete offers great technical advantages in comparison to other kinds of construction for example reinforced concrete and steel. They possess improved potential to deal with shearing forces, because of the aftereffect of compressive prestress, which cuts down on the concepts tensile stress. Using curved cables, specifically in lengthy span people reduces shear forces developed in the support sections. A prestressed concrete flexural member is stiffer under working loads than the usual RCC member of the identical depth. However, following the start of cracking, the flexure behavior is comparable to those of RCC, Within the lengthy-span range; prestressed concrete is usually cheaper than reinforced concrete and steel. Prestressed concrete has considerable resilience because of its convenience of completely dealing with substantial results of overloading without undergoing any serious damage. In prestressed concrete elements, cracks which temporarily develop under periodic overloading close-up completely once the loads are removed. Because of usage of concrete within the tension zone, an additional saving of fifteen to thirty Percent in concrete can be done in comparison to reinforced concrete. Although there's considerable conserving the amount of materials in prestressed concrete people in comparison to RCC, it's not much significant because of the additional costs incurred for that high strength concrete, high tensile steel, anchorages along with other hardware needed for manufacture of prestressed people.

VI. REFERENCES

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