THE ARCHITECT MEMBER OF THE SUPERVISORY TEAM IN THE CONSTRUCTION OF MULTIFAMILY BUILDINGS

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ABSTRACT

This research aims to determine the incidence of the architect of the supervisory team in the conformity of work in multifamily buildings in 2019, allowing us to see the participation of the architect as a supervisor in the results and how their participation influences. The methodology used is composed of a non-experimental type of research, a mixed approach because it is qualitative and quantitative with a descriptive correlational scope; through the observation of items and the use of surveys, with a sample of 47 multi-family buildings. According to the results obtained from the statistical process, the confirmation of the general hypothesis with a correlation of (0.715) is mentioned, in the same way in the case of trace control and stakeout with a correlation of (0.838); of the fixed finishes of (0.798) and the non-fixed finishes with a correlation of (0.870). Finally, it is concluded that the architect's role as a supervisor is a function that can be carried out in work to achieve the conformity of a piece of multi-family buildings and the control of the line and the disposition elements Fixed. Non-fixed finishes are related and influence the decrease in observations on the variation of measurements and dimensions in the quality and conformity of the work of multi-family buildings.

KEYWORDS

Work supervision, Multifamily buildings, Supervisory team, Supervising architect, Fixed and non-fixed finishes to the structure.

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1. INTRODUCTION

Construction in Peru has been linked to countless problems, from those that arise at the beginning of a building to the regularization due to informality or modifications.

Suppose we can pay attention to this problem. In that case, we see that the need to build is linked to the need for housing and property ownership, leading to investing a lot of money from the beginning to its completion and formalization (20 Minutos Editora S. L., 2019).

If we understand the significant investment or expense that it generates, we do not know why not all due attention is given to the construction of buildings in the private sector; it is only regulated by laws, formulating regulations, or delegating responsibilities to professional associations or municipalities to supervise this construction activity. As a result of this activity, the real estate, carried out by many construction or real estate companies dedicated to this area, becomes a work with a series of questions, which does not transcend or are not known (ADI PERU, 2018).

Faced with this reality, we see that the informality in the construction and the lack of supervision during its construction is what is perceived, where most of the companies become judge and party, by supervising themselves, and in others, this activity does not even exist as part of their organization; in some cases, the development of the work is delegated to a resident, being the execution in many cases carried out by third parties or subcontractors. These companies seek to gain time and achieve the lowest possible cost, which will often result in non-compliance with regulations and correct construction procedures, leading to work with deficiencies and non-compliance with what was agreed with the client.

One of the factors, and we believe that it is the most crucial factor contributing to the success of a work, is synergic and permanent work supervision. This group must be professional, ethical, and specialized in controlling all the processes carried out during the construction of a building, in this case, a multifamily building (Barbaran, 2018).

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The supervision of works in multifamily buildings is a very delicate activity. It requires to be analyzed from several angles, from the point of view of the employer and/or real estate, the builder or executor, the supervisor of the work, the entities that control the building, such as municipalities, central government, and professional associations, as well as the future use of this building, should also participate (Alvarez, 2018).

The supervision of construction work in buildings is an activity that, due to its complexity, requires the participation of more than one specialist to be carried out properly; at present, in buildings constructed by private investment, the district municipalities are responsible for the control of this activity, through their inspection areas or the technical supervisors appointed by the engineering or architectural associations. If we talk about private companies, it should be noted that very few companies allocate investment to supervise the construction work.

In most of the buildings of private investment, it is the resident of work the one in charge of the supervision of work, becoming the supervisor of the tasks executed by him.

Supervising works in multifamily buildings is an essential activity due to the investment involved in executing the job and its social importance. It is necessary to control and keep statistics of all the tasks performed during construction and how they were completed. If modifications to the original project, their causes, and how they were executed, this information should be available to any owner or future property user. But at present, this is not the case; there are no statistics on the results of this participation of the supervision, nor of the observations made by the users to the final product, which does not contribute to delivering work with guarantee and quality (Bohorquez *et al.*, 2020).

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2. METHOD

2.1. TYPE OF RESEARCH

Descriptive: It is oriented to the knowledge of the professional architect as supervisor, and it will be investigated as it develops its activity in the district Miraflores in the year 2019. Its characteristics will be determined and, if they allow influencing the conformity of the work (Cardenas, 2019).

Correlational: It aims to determine the degree of incidence between the variables of the supervising architect and the conformity of the work.

2.2. POPULATION AND SAMPLE

The size is finite and will cover new multifamily buildings that conform to work by the Municipality of the district Miraflores, city of Metropolitan Lima, in 2019. Therefore, the indicated data have been obtained from the same municipality of Miraflores, where the conformity of work delivered to multifamily buildings from January to December 2019 has been collected for each month, bringing the following data:

The "sample will be a significant representation of the population" of multifamily buildings with work conformity in the district of Miraflores, province of Lima, under the assumption of a 5% error; we will study the characteristics of this set (Carretero & Moreno, 2019).

To find the "finite population sample size," the formula 1 shown below will be used:

It is necessary to define the "Confidence level" (Z) and "Absolute precision level" (d) for the equation shown above, based on the "experimental certainty level", shown in the following lines:

For the present investigation, we have N = 53 buildings.

The values of p = 0.5 q = 0.5 are assumed.

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From the above table, a C = 95 % (d = 5 %) is assumed, with a

Z = 1.96

Next, the values are replaced in the equation that was initially shown. Thus we have:

$$n = \left[\frac{(53) * (1.96)^2 * (0.5) * (0.5)}{(0.05)^2 * (53-1) + (1.96)^2 * (0.5) * (0.5)}\right] = 46.6812179$$

Rounding up our sample =47 multifamily buildings.

3. RESULTS

In this section, we can visualize the results of the survey taken from 47 participants, specifying the importance and incidence of the architect in the conformity of work in multifamily buildings in the district of Miraflores, all of this for its interpretation.

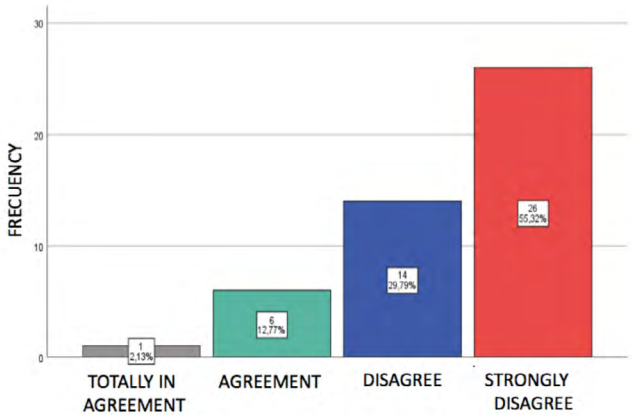

Figure 1. Graph of the question "A team is required for site supervision.".

Source: own elaboration.

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According to Figure 1, of the 47 respondents, more than half of them "Strongly agree" 26 (55.3%) that a team is required for construction supervision, 14 (29.8%) "Agree", 6 (12.8%) "Disagree" and 1 (2.1%) "Strongly disagree"; that is, more than half of the participants show that it is essential to have a construction supervision team in multifamily buildings (EcuRed, 2018).

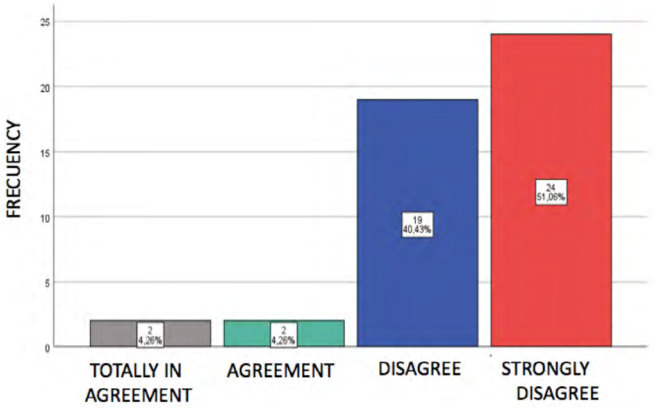

Figure 2. Graph of the question "The architect should be the supervisor of the architecture specialty."

Source: own elaboration.

Regarding Figure 2, that the participants, 24 (51.1%) "Strongly agree" that the architect should be the supervisor of the architecture specialty, 19 (40.4%) "Agree," 2 (4.3%) "Indifferent," 2 (4.3%) "Strongly disagree"; that is, they consider the specialty necessary at the time of supervision in the area of architecture.

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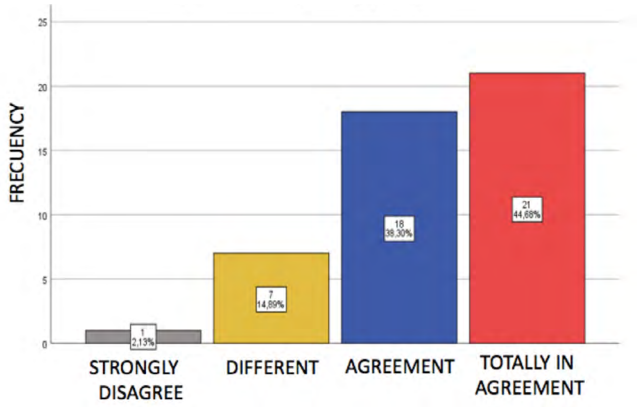

Figure 3. Graph of the question "The architect should be part of the supervision team".

Source: own elaboration.

Regarding Figure 3, of the participants, 21 (44.7%) are "Strongly agree," 18 (38.3%) "Agree," 7 (14.9%) "Indifferent," 1 (2.1%) "Strongly disagree"; i.e., the majority considers that the participation of the architect in the supervisory team is essential for the compliance of work, offering a more multidisciplinary team, with different perspectives (Davila, 2019).

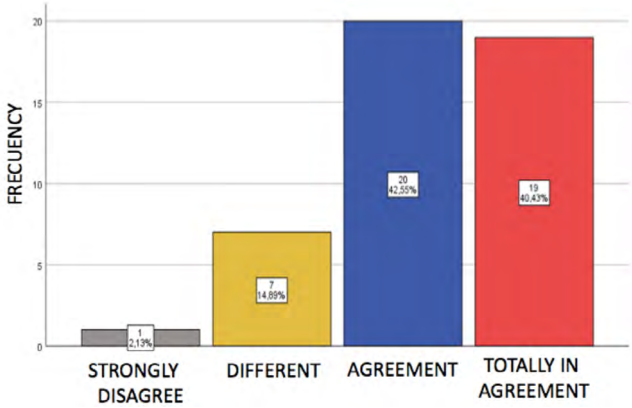

Figure 4. Graph of the question "This item affects the quality of the work.".

Source: own elaboration.

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According to Figure 4, the answer that stood out is "Strongly agree" and "Agree", with 20 (42.6%) for both solutions, followed by 7 (14.9%) "Indifferent" and 1 (2.1%) "Strongly disagree" concerning the control of the drawing and stakeout items for the quality of work and that leads to the conformity of the work, decreasing the observations on the variation of measures and dimensions of the rooms of the real estate unit (El Comercio, 2018).

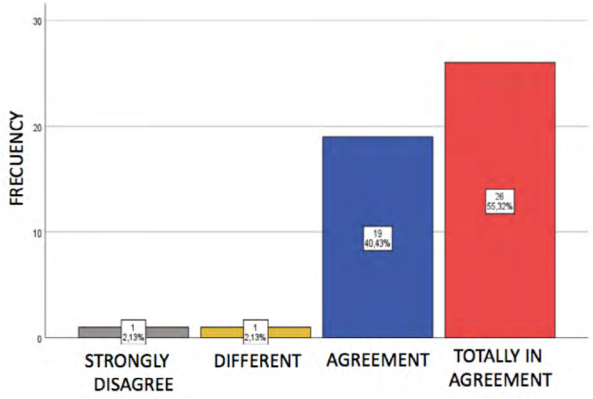

Figure 5. Graph of the question "This item affects the quality of the work".

Source: own elaboration.

In Figure 5 shows that the answer that stands out is "Strongly agree" 26 (55.3%), "Agree" 19 (40.4%), "Indifferent" 1 (2.1%), and "Strongly disagree" both with 1 (2.1%); that is, the control of the finishes fixed to the structure achieves a decrease in the observations to the conformity of work, which affects the agreement of work in multifamily buildings. (Fernandez, Moyano, & Chaza, 2019).

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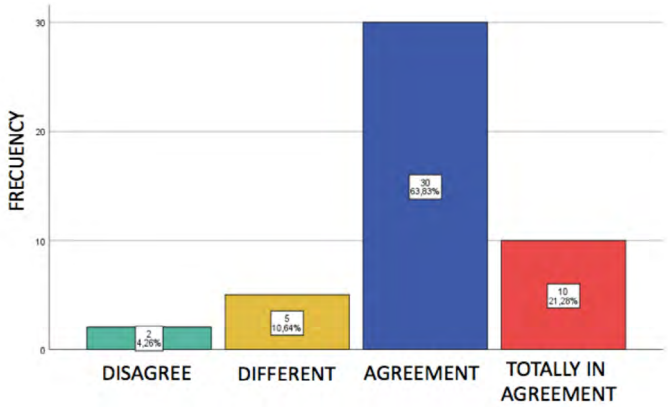

Figure 6. Graph of the question "Should the architect participate in the items (scaffolding and veneer)."

Source: own elaboration.

According to Figure 6, has as the most definitive answer "Agree" with 30 (63.8%), followed by "Strongly agree" 10 (21.3%), "Indifferent" 5 (10.5%), "Disagree" 2 (4.3%), this shows that the participation of the architect of the supervising team is essential in the control of items of fixed finishes to the structure (tiling and veneers), thus decreasing the observations (Flores, 2019).

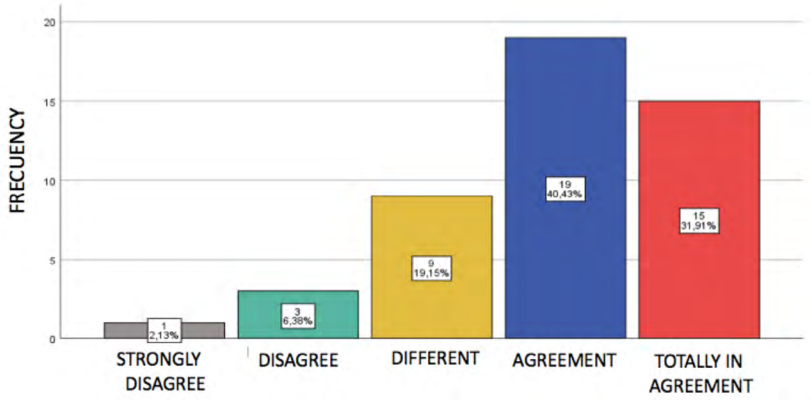

Figure 7. Graph of the question "This item affects the quality of the work".

Source: own elaboration.

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According to the present Figure 7, the answers of the respondents show "Agree" 19 (40.4%), "Strongly agree" 15 (31.9%), "Indifferent" 9 (19.1%), "Disagree" 3 (6.4%), and "Strongly disagree" 1 (2.1%). These data show us that the quality of work also depends on the control of the fixed finishing items, consequently, the conformity of the work (Hernandez *et al.*, 2020).

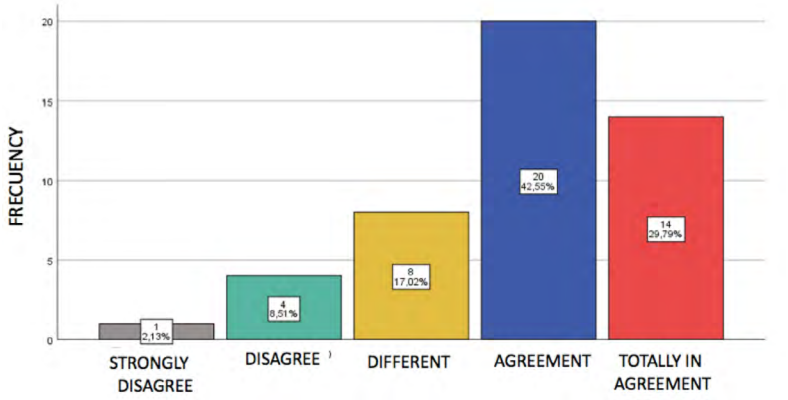

Figure 8: Graph of the question "Should the architect participate in the carpentry of openings, floors, furniture."

Source: own elaboration.

Regarding Figure 8, the results obtained are 17, "Agree" 20 (42.6%), "Strongly agree" 14 (29.8%), "Disagree" 8 (17.0%), "Disagree" 4 (8.5%), and "Strongly disagree" 1 (2.1%), which leads us to conclude that the architect's participation in the control of carpentry items is essential for the conformity of a work (Hernandez, 2018).

4. DISCUSSIONS

According to the first objective of determining the incidence of the architect of the supervisory team in the compliance of work, it was obtained as a result that the architect of the supervisory team directly affects the submission of work in multifamily buildings in the district of Miraflores in the city of Metropolitan Lima, in the year 2019, with a considerable positive correlation.

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With the above mentioned, the studies found either national and international, which precede this work, do not present a direct relationship because the work is novel that seeks to propose the architect as supervisor (Lengua, 2018).

Therefore, the investigations that partially coincide with the research are the following: architects and future construction professionals cannot be left aside, it is necessary to contribute supported by a strong sense of responsibility, obtaining the best results in the activities that have been entrusted to them, making in turn, more efficient the personnel in their charge (Vela *et al.*, 2021).

In the case of the specific objectives, the result obtained from the first clear objective: the control of the layout and stakeout items have a favorable impact on the conformity of a multifamily building, with a significant positive association" between the two variables, this coincides with "the adequate control of the layout and stakeout items in the value of the building works, which generally is not given due importance, perhaps due to ignorance of some indicators or references that allow quantifying it, which emphasizes the importance of controlling these items to minimize losses either economic or time, which falls on the conformity of the work (Pacheco, 2020).

According to the second specific objective, to analyze the incidence of the control of the items of fixed finishes in the conformity of a multifamily building, its result was that the power of the things of appointed finishes to the structure generates a positive incidence in the agreement of a multifamily building being these variables correlative (Reyes, 2018).

The close relationship between the company and the subcontractor and the trim control in the supervision give rise to non-compliance with the deadline and a preliminary order of the various items of finishes, this reaffirms the research on management of the things, for the best quality of work, as well as the conformity of this and the support of the architect, is a proposal that would help in the control of the items as a supervising professional (Rodriguez & Sanchez, 2019).

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Finally, the third objective that seeks to examine the incidence of the control of the non-fixed finishes items to the structure in the conformity of the client of a multifamily building, obtained. As a result, the power of the non-fixed finishes items to the design affects positively in the unity of a multifamily building, and that keeps a robust positive correlation between the non-fixed finishes to the system with the agreement of the work; The research that supports this assertion, the study conducted on the four items reveals that in the finishing phase there is a large inventory of partial products with up to one month of waiting time. It should be decided to prioritize the activities and place some of them at the end of the schedule so that there are no long waits. Set clear goals to reduce waiting times, i.e., this involves, directly and indirectly, the control of these items for the efficiency of all these requirements that need the finishes, whether fixed or not fixed, with the supervision of an architect who has the capacity for this purpose (Villanueva *et al.*, 2021).

5. CONCLUSIONS

The association of the architect of the supervisory team and the compliance of work in multifamily buildings presented a result of 0.715 evidenced by the answers given by the participants, which are mentioned below: "A team is required for site supervision", the responses that most highlighted "agree" and "strongly agree" (29.8% and 55.3%) respectively; "The team should be permanently on site" (36.2% and 40.4%); "The architect should be the supervisor of the architectural specialty" (40.4% and 51.1%); "Does the architect have the academic training to be part of the supervisory team" (46.8% and 29.8%); "The architect should be part of the supervisory team" (38.3% and 44.7%); "He has an impact on the compliance of the work" (63.8%) and for the question "His participation would delay the work" the answers that stood out the most were "totally disagree" and "disagree" (44.7% and 36.2%) respectively. This shows that the architect's role as a supervisor is a function that can be carried out on a construction site to achieve compliance in multifamily buildings. This as a proposal of involvement or action of the architect as the person in charge of the supervisory area; therefore, he must be adequately trained and prepared for any case or problem that may occur and be solved efficiently.

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Although the architect has a preconceived misconception that he is only for architectural design, part of his training is to supervise and control the project from beginning to end, construction planning, etc. This makes him a person professionally capable of generally developing in the supervision of multifamily buildings.

In the case of correlation of control of the items of layout and stakeout for the conformity of work of multifamily buildings, it shows an association of 0.838, evidenced by the questions related to these variables, such as the following: "The item has an impact on the quality of the work", the answers that stood out the most were "agree" and "totally agree" (42.6% and 40.4%) respectively; "The architect should participate in the initial layout of the work" (36.2% and 19.1%); "He should participate in the other stakeout items during the work" (53.2% and 12.8%); "These items have an impact on the conformity of the work" (55.3% and 8.5%). Therefore, it is essential to consider that planning involves the quality of work and the reduction of observations on the variation of measures and dimensions of the real estate unit rooms that make the project compatible with the work area. Therefore, reasonable control and supervision in this phase directly impact the conformity of the work.

Regarding the association between the control of the items of fixed finishes to the structure and the conformity of the work, a correlation of 0.798 was obtained, evidenced by the questions related to these variables, such as the following: "This item affects the quality of work", the answers that stood out the most were "agree" and "totally agree" (40.4% and 55.3%) respectively; "The architect should participate in the items (Tarrajeo and veneers)" (63.8% and 21.3%); "These items have an impact on the conformity of the work" (63.8% and 14.9%); for the question "If he participates, he should be permanent", the answers that stood out the most were "indifferent" and "agree" (25.5% and 8.5%) respectively. This shows a decrease of observations in the process of work compliance, which involves the execution and deficient finishes of walls, floors, and ceilings and affects work compliance and the quality of multifamily buildings achieved based on the individual supervision either by the architect.

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In conclusion, according to the correlation between the variable of control of the items of non-fixed finishes to the structure and conformity of work of multifamily buildings, the figure obtained was 0.870, which is supported by the following questions: "Does this item have an impact on the quality of the work", with a higher percentage of "agree" and "totally agree" answers (40.4% and 31.9%) respectively; "Should the architect participate in the items of carpentry in openings, floors, furniture" (42.6% and 29.8%); "In the case of the question "If he participates, he should be permanently on-site", the most important answers were "indifferent" and "in agreement" (46.8% and 25.5%). The shows mentioned above that the control of the non-fixed finishing items to the structure, although it is a final part of the construction process, its supervision is essential, since it decreases the observations of the owner, as well as increases the quality of the work, complying with the requirements in the building and of course reaching the conformity of the work, for the satisfaction of both the company and the client.

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