ABSTRACT

Title: Analysis of Cap Pile with Strut and Tie Method on Infrastructure Development in Sukabumi City, Name: Irfan Naseh Iskandar, NIM: 41117310055, Advisor: Resi Aseanto, ST, MT, Year 2018/2019.

Pile cap is one of the important elements of a structure. This is because the pile cap has an important role in the distribution of structural loads to the pile and then forwarded to the ground. In general, geotechnical and structural engineers, when designing deep foundations , rarely take into account the contribution of a pile cap , whereas often the dimensions of the pile cap are quite large and thick.

There are two general approaches to designing a pile cap . In the first approach, the pile cap is considered a high beam and is designed to slide in the critical section. Another method that can be used is the strut and tie method , namely by dividing the structure in two regions namely, regions D and B. Where, areas that are no longer flat and perpendicular to the neutral line before and after bending are specified by nonlinear strain, called area D (Distrubed or Discontinuity) and the area where Bernoulli's law applies is called area B (Bending or Bernoulli) . In this method, the compressive strength is assumed to be distributed through compressive struts without reinforcement to the nodal area at each pile point and tensile strength occurs between the posts given by the tie tension formed by reinforcement (reinforcement).

the strut and tie method provides a wider area of reinforcement but with placement in accordance with the flow of force that occurs so that the location of the reinforcement is really right where it is needed, so that the reinforcement work function becomes more effective, while using the conventional method the reinforcement is used fewer placements at the same level, as for the results for the calculation, namely:

1. *Strut and Tie Method: in the tie section used iron 3 D 16 which is placed above the pile (pile), while the area between the pile (outside of the tie) is used 10 Ø 13, while for the area of tota is 1930.21 mm2.*
2. *Conventional Method: on this reinforcement the total amount of reinforcement used is 14 D 16 which is placed / distributed evenly along the pile cap with a total reinforcement area of 2924.54 mm2.*
3. *For comparison in terms of price, it can be concluded that the Strut and Tie method costs Rp. 2,043,888, while the conventional method is Rp. 1,788,402,*
4. *The implementation schedule for the work of the pile cap with the Strut and Tie method was found to be longer because the distance between reinforcement varies so that it is difficult for workers, unlike the conventional method,*

From the two methods, the difference is 52% seen from the area of reinforcement while for the benefits obtained by the method of strut and tie is the ease of calculation of force and can analyze the flow of force that occurs so that the location of reinforcement is really right where it is needed so that the work function reinforcement becomes more effective while for its disadvantages, the total reinforcement area is much larger.

Keyword: pile cap , ACI building code , strut and tie model.