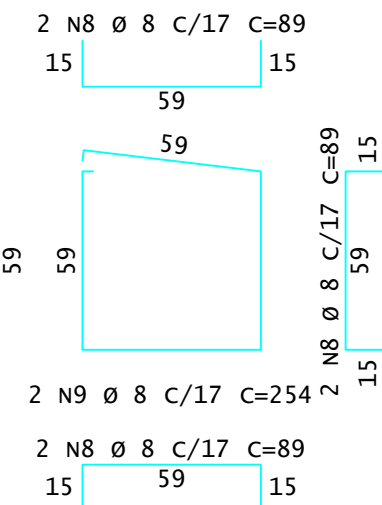
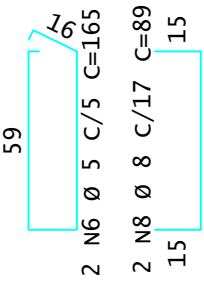
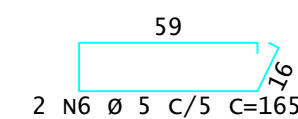
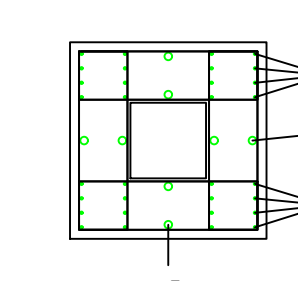
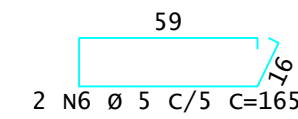
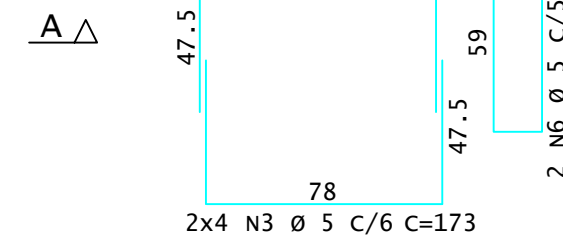
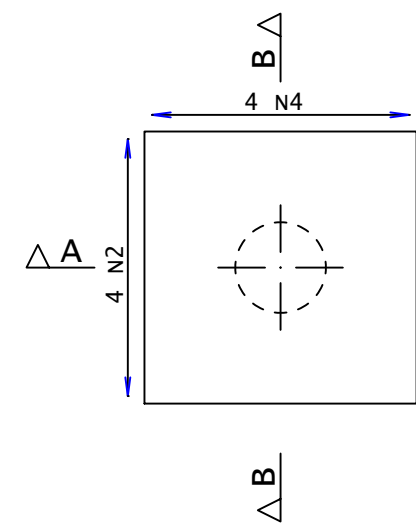
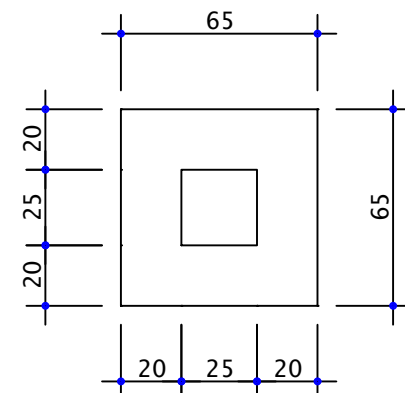


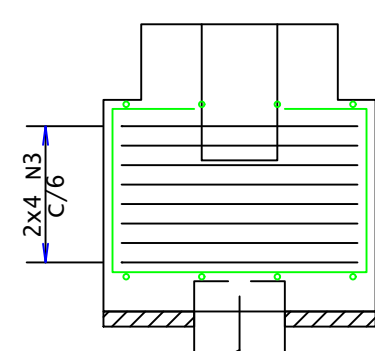
(ESCALA 1:25)

The diagram shows a square cross-section of a beam with a square hole in the center. The outer square has a side length of  $4N/2$ , and the inner square hole has a side length of  $4N/4$ . The beam's width is labeled  $A$  and its height is labeled  $B$ . The diagram is used to illustrate the calculation of the beam's moment of inertia.

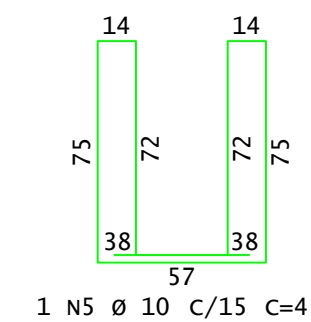
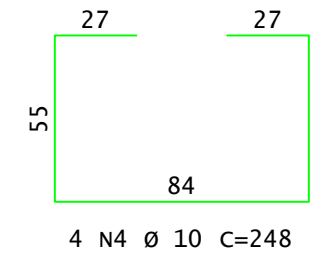
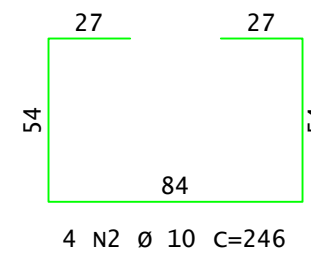
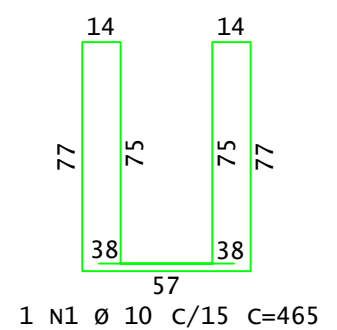
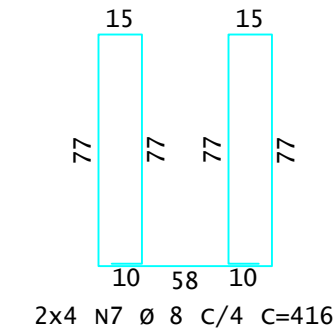


Technical drawing of a mechanical part with dimensions and tolerances. The part is shown in two views: a front view (top) and a side view (bottom). The front view shows a rectangular block with a central slot. The dimensions are: total width 30, total height 70, and a central slot of width 20 and height 25. The side view shows the block is 50 units thick. The drawing includes various tolerances: N6, N9, N8, and N9. The central slot is dimensioned with a tolerance of N8. The side view shows a tolerance of N9. The drawing is a technical drawing of a mechanical part with dimensions and tolerances.

Technical drawing of a stepped shaft. The shaft has a total length of 60 units. The diameter of the main shaft is 25 units. The diameter of the central step is 20 units. The length of the central step is 10 units. The shaft is shown in a cross-sectional view with hatching on the right side.



Technical drawing of a rectangular plate. The plate has a width of  $2 \times 4$  and a height of  $\frac{N3}{C/6}$ . The plate is divided into sections labeled N6, N8, and N9. A central section is labeled N8. A dimension of 9 is indicated for the central section. The plate is shown with a grid pattern and a cross-section view at the bottom.



| AÇO       | POS | BIT | QUANT | COMPRIMENTO |       |
|-----------|-----|-----|-------|-------------|-------|
|           |     |     |       | UNIT        | TOTAL |
|           |     | mm  |       | cm          | cm    |
| FP2 (X14) |     |     |       |             |       |
| 50A       | 1   | 10  | 14    | 465         | 6510  |
| 50A       | 2   | 10  | 56    | 246         | 13776 |
| 60A       | 3   | 5   | 112   | 173         | 19376 |
| 50A       | 4   | 10  | 56    | 248         | 13888 |
| 50A       | 5   | 10  | 14    | 455         | 6370  |
| 60A       | 6   | 5   | 112   | 165         | 18480 |
| 50A       | 7   | 8   | 112   | 416         | 46592 |
| 50A       | 8   | 8   | 112   | 89          | 9968  |
| 50A       | 9   | 8   | 28    | 254         | 7112  |

| RESUMO DE AÇO |     |       |         |
|---------------|-----|-------|---------|
| AÇO           | BIT | COMPR | PESO    |
|               | mm  | m     | kgf     |
| 60A           | 5   | 379   | 59      |
| 50A           | 8   | 637   | 252     |
| 50A           | 10  | 406   | 251     |
| Peso Total    |     | 60A = | 59 kgf  |
| Peso Total    |     | 50A = | 503 kaf |

|  |   |  |       |         |        |          |      |          |
|--|---|--|-------|---------|--------|----------|------|----------|
| EMPRESA CONTRATADA:  | RESPONSÁVEL TÉCNICO:  | PROPRIETÁRIO:  |       |         |        |          |      |          |
| <div><p><b>kolf</b><br/>engenharia</p></div>  | <div>LUIZ FERNANDO C. MEGIOLARO<br/>ENGENHEIRO CIVIL<br/>CREA - PR 179004/D</div> | <div>PREFEITURA MUNICIPAL DE MARMELEIRO<br/>CNPJ: 76.205.665/0001-01</div>   |       |         |        |          |      |          |
| OBRA/ENDEREÇO:   |   |  |       |         |        |          |      |          |
| <div><h2>GINÁSIO EMEF PERSEVERANÇA</h2><p>RUA DAS GRAPIAS, 160, BAIRRO ARAUCÁRIA, MARMELEIRO - PR. CEP 85615-000</p></div>   |   |  |       |         |        |          |      |          |
| <div>KOLF SERVIÇOS DE ENGENHARIA<br/>CNPJ: 07.555.412/0001-37<br/>RUA FREI EVERALDO, 5555, SALA 1<br/>CHOPINZINHO - PR - 85560-000<br/>(46)9 9908-2448<br/>GABRIEL@COLFERAI.ENG.BR</div> | <div>PROJETO:<br/><br/>PROJETO ESTRUTURAL - PRÉ MOLDADO</div>                     | <table><tr><td>DES.</td><td>LUIZ</td></tr><tr><td>ESCALA</td><td>INDICADA</td></tr><tr><td>DATA</td><td>OUT/2025</td></tr></table> | DES.  | LUIZ    | ESCALA | INDICADA | DATA | OUT/2025 |
| DES.   | LUIZ  |  |       |         |        |          |      |          |
| ESCALA   | INDICADA  |  |       |         |        |          |      |          |
| DATA   | OUT/2025  |  |       |         |        |          |      |          |
|  | <div>CONTEÚDO DA PRANCHA:<br/>DETALHAMENTO CÁLCES;</div>                          | <table><tr><td>FOLHA</td><td>REVISÃO</td></tr><tr><td>16/16</td><td>01</td></tr></table>   | FOLHA | REVISÃO | 16/16  | 01       |      |          |
| FOLHA  | REVISÃO   |  |       |         |        |          |      |          |
| 16/16  | 01  |  |       |         |        |          |      |          |