

|                                                                                   |                                                                                                                                                                                                                                                              |  |                                                                                     |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|
|  | <p align="center">INFORME DE ENSAYO</p> <p align="center"><b>PESO UNITARIO EN MUESTRAS IRREGULARES</b></p> <p align="center"><b>(MÉTODO PARAFINADO)</b></p> <p align="center"><b>METODO ISRM-07</b></p> <p align="center">Referencia SYP-PT-DT-1089-5/14</p> |  |  |
|                                                                                   | <p align="right">ISO / IEC 17025:2005<br/>10-LAB-040</p>                                                                                                                                                                                                     |  |                                                                                     |

|                     |                                            |                              |            |
|---------------------|--------------------------------------------|------------------------------|------------|
| <b>PROYECTO:</b>    | CYDG-844 REDES MANOV INGENIERIA            | <b>FECHA DE ENSAYO:</b>      | 2018-03-07 |
| <b>CLIENTE:</b>     | INGENIERÍA, CONSTRUCCIONES Y DISEÑO S.A.S. | <b>ORDEN DE TRABAJO No.</b>  | 8084       |
| <b>DIR CLIENTE:</b> | CALLE 53 A No. 16 - 36 BOGOTÁ              | <b>INFORME DE ENSAYO No.</b> | 8084-132   |
| <b>CÓDIGO:</b>      | 2343                                       |                              |            |

|                 |                   |                   |                 |
|-----------------|-------------------|-------------------|-----------------|
| <b>EQUIPOS:</b> | Calibrador No: 17 | Balanza No: 16-03 | Horno No: HN-01 |
|-----------------|-------------------|-------------------|-----------------|

|                                                                       |            |                 |          |                         |                    |
|-----------------------------------------------------------------------|------------|-----------------|----------|-------------------------|--------------------|
| <b>PERFORACIÓN:</b>                                                   | <b>P37</b> | <b>MUESTRA:</b> | <b>2</b> | <b>PROFUNDIDAD(m) :</b> | <b>1,70 - 2,50</b> |
| <b>DESCRIPCIÓN:</b> Arcilla, de color grisáceo claro, con oxidaciones |            |                 |          |                         |                    |
| <b>OBSERVACIONES:</b> -                                               |            |                 |          |                         |                    |

| <table border="1"> <tr><th align="center" colspan="2">Wn</th></tr> <tr><td>Recipiente</td><td align="center">12</td></tr> <tr><td>P<sub>1</sub> (g)</td><td align="center">156,78</td></tr> <tr><td>P<sub>2</sub> (g)</td><td align="center">98,39</td></tr> <tr><td>P<sub>3</sub> (g)</td><td align="center">19,20</td></tr> <tr><td>Humedad</td><td align="center"><b>73,7%</b></td></tr> </table> |              |                                                       | Wn |                                      | Recipiente | 12 | P <sub>1</sub> (g) | 156,78 | P <sub>2</sub> (g) | 98,39 | P <sub>3</sub> (g) | 19,20 | Humedad | <b>73,7%</b> | <table border="1"> <tr><th align="center" colspan="2">PESO UNITARIO</th></tr> <tr><td>W1</td><td align="center">275,5</td></tr> <tr><td>W2</td><td align="center">286,4</td></tr> <tr><td>W3</td><td align="center">97,7</td></tr> <tr><td>gt (g/cm³)</td><td align="center"><b>1,560</b></td></tr> <tr><td>gd (g/cm³)</td><td align="center"><b>0,898</b></td></tr> </table> |  |  | PESO UNITARIO |  | W1 | 275,5 | W2 | 286,4 | W3 | 97,7 | gt (g/cm³) | <b>1,560</b> | gd (g/cm³) | <b>0,898</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------|----|--------------------------------------|------------|----|--------------------|--------|--------------------|-------|--------------------|-------|---------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------|--|----|-------|----|-------|----|------|------------|--------------|------------|--------------|
| Wn                                                                                                                                                                                                                                                                                                                                                                                                   |              |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| Recipiente                                                                                                                                                                                                                                                                                                                                                                                           | 12           |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| P <sub>1</sub> (g)                                                                                                                                                                                                                                                                                                                                                                                   | 156,78       |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| P <sub>2</sub> (g)                                                                                                                                                                                                                                                                                                                                                                                   | 98,39        |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| P <sub>3</sub> (g)                                                                                                                                                                                                                                                                                                                                                                                   | 19,20        |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| Humedad                                                                                                                                                                                                                                                                                                                                                                                              | <b>73,7%</b> |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| PESO UNITARIO                                                                                                                                                                                                                                                                                                                                                                                        |              |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| W1                                                                                                                                                                                                                                                                                                                                                                                                   | 275,5        |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| W2                                                                                                                                                                                                                                                                                                                                                                                                   | 286,4        |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| W3                                                                                                                                                                                                                                                                                                                                                                                                   | 97,7         |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| gt (g/cm³)                                                                                                                                                                                                                                                                                                                                                                                           | <b>1,560</b> |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| gd (g/cm³)                                                                                                                                                                                                                                                                                                                                                                                           | <b>0,898</b> |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| P <sub>1</sub> = Peso del recipiente mas muestra húmeda                                                                                                                                                                                                                                                                                                                                              |              | P <sub>2</sub> = Peso del recipiente mas muestra seca |    | P <sub>3</sub> = Peso del recipiente |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| W1= Masa de la muestra humeda                                                                                                                                                                                                                                                                                                                                                                        |              | W2= Masa de la muestra parafinada                     |    | W3= Masa parafinada sumergida        |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| <b>SONDEO:</b>                                                                                                                                                                                                                                                                                                                                                                                       | -            | <b>MUESTRA:</b>                                       | -  | <b>PROFUNDIDAD(m) :</b>              | -          |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| <b>DESCRIPCIÓN:</b> -                                                                                                                                                                                                                                                                                                                                                                                |              |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |
| <b>OBSERVACIONES:</b> -                                                                                                                                                                                                                                                                                                                                                                              |              |                                                       |    |                                      |            |    |                    |        |                    |       |                    |       |         |              |                                                                                                                                                                                                                                                                                                                                                                               |  |  |               |  |    |       |    |       |    |      |            |              |            |              |

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------|----|--------------------------------------|------------|---|--------------------|---|--------------------|---|--------------------|---|---------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------|--|----|---|----|---|----|---|------------|---|------------|---|
| Wn                                                                                                                                                                                                                                                                                                                                                                          |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| Recipiente                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>1</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>2</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>3</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| Humedad                                                                                                                                                                                                                                                                                                                                                                     | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| PESO UNITARIO                                                                                                                                                                                                                                                                                                                                                               |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W1                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W2                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W3                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| gt (g/cm³)                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| gd (g/cm³)                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>1</sub> = Peso del recipiente mas muestra húmeda                                                                                                                                                                                                                                                                                                                     |   | P <sub>2</sub> = Peso del recipiente mas muestra seca |    | P <sub>3</sub> = Peso del recipiente |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W1= Masa de la muestra humeda                                                                                                                                                                                                                                                                                                                                               |   | W2= Masa de la muestra parafinada                     |    | W3= Masa parafinada sumergida        |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| <b>SONDEO:</b>                                                                                                                                                                                                                                                                                                                                                              | - | <b>MUESTRA:</b>                                       | -  | <b>PROFUNDIDAD(m) :</b>              | -          |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| <b>DESCRIPCIÓN:</b> -                                                                                                                                                                                                                                                                                                                                                       |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| <b>OBSERVACIONES:</b> -                                                                                                                                                                                                                                                                                                                                                     |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------|----|--------------------------------------|------------|---|--------------------|---|--------------------|---|--------------------|---|---------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------|--|----|---|----|---|----|---|------------|---|------------|---|
| Wn                                                                                                                                                                                                                                                                                                                                                                          |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| Recipiente                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>1</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>2</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>3</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| Humedad                                                                                                                                                                                                                                                                                                                                                                     | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| PESO UNITARIO                                                                                                                                                                                                                                                                                                                                                               |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W1                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W2                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W3                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| gt (g/cm³)                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| gd (g/cm³)                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>1</sub> = Masa del recipiente mas muestra húmeda                                                                                                                                                                                                                                                                                                                     |   | P <sub>2</sub> = Masa del recipiente mas muestra seca |    | P <sub>3</sub> = Masa del recipiente |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W1= Masa de la muestra humeda                                                                                                                                                                                                                                                                                                                                               |   | W2= Masa de la muestra parafinada                     |    | W3= Masa parafinada sumergida        |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| <b>SONDEO:</b>                                                                                                                                                                                                                                                                                                                                                              | - | <b>MUESTRA:</b>                                       | -  | <b>PROFUNDIDAD(m) :</b>              | -          |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| <b>DESCRIPCIÓN:</b> -                                                                                                                                                                                                                                                                                                                                                       |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| <b>OBSERVACIONES:</b> -                                                                                                                                                                                                                                                                                                                                                     |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |

| <table border="1"> <tr><th align="center" colspan="2">Wn</th></tr> <tr><td>Recipiente</td><td align="center">-</td></tr> <tr><td>P<sub>1</sub> (g)</td><td align="center">-</td></tr> <tr><td>P<sub>2</sub> (g)</td><td align="center">-</td></tr> <tr><td>P<sub>3</sub> (g)</td><td align="center">-</td></tr> <tr><td>Humedad</td><td align="center">-</td></tr> </table> |   |                                                       | Wn |                                      | Recipiente | - | P <sub>1</sub> (g) | - | P <sub>2</sub> (g) | - | P <sub>3</sub> (g) | - | Humedad | - | <table border="1"> <tr><th align="center" colspan="2">PESO UNITARIO</th></tr> <tr><td>W1</td><td align="center">-</td></tr> <tr><td>W2</td><td align="center">-</td></tr> <tr><td>W3</td><td align="center">-</td></tr> <tr><td>gt (g/cm³)</td><td align="center">-</td></tr> <tr><td>gd (g/cm³)</td><td align="center">-</td></tr> </table> |  |  | PESO UNITARIO |  | W1 | - | W2 | - | W3 | - | gt (g/cm³) | - | gd (g/cm³) | - |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------|----|--------------------------------------|------------|---|--------------------|---|--------------------|---|--------------------|---|---------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------|--|----|---|----|---|----|---|------------|---|------------|---|
| Wn                                                                                                                                                                                                                                                                                                                                                                          |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| Recipiente                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>1</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>2</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>3</sub> (g)                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| Humedad                                                                                                                                                                                                                                                                                                                                                                     | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| PESO UNITARIO                                                                                                                                                                                                                                                                                                                                                               |   |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W1                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W2                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W3                                                                                                                                                                                                                                                                                                                                                                          | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| gt (g/cm³)                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| gd (g/cm³)                                                                                                                                                                                                                                                                                                                                                                  | - |                                                       |    |                                      |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| P <sub>1</sub> = Masa del recipiente mas muestra húmeda                                                                                                                                                                                                                                                                                                                     |   | P <sub>2</sub> = Masa del recipiente mas muestra seca |    | P <sub>3</sub> = Masa del recipiente |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |
| W1= Masa de la muestra humeda                                                                                                                                                                                                                                                                                                                                               |   | W2= Masa de la muestra parafinada                     |    | W3= Masa parafinada sumergida        |            |   |                    |   |                    |   |                    |   |         |   |                                                                                                                                                                                                                                                                                                                                              |  |  |               |  |    |   |    |   |    |   |            |   |            |   |

|     |                                                                                                |
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| HCF | <b>REVISÓ Y APROBÓ</b> _____<br><b>GREGORIO ROJAS ROJAS</b><br><small>DIRECTOR TÉCNICO</small> |
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LOS RESULTADOS PRESENTADOS CORRESPONDEN ÚNICAMENTE A LA MUESTRA SOMETIDA A ENSAYO. ESTE INFORME NO PUEDE SER REPRODUCIDO EN SU TOTALIDAD NI PARCIALMENTE, SIN LA AUTORIZACIÓN ESCRITA DEL LABORATORIO QUE LO EMITE. ESTE INFORME NO ES VÁLIDO SIN LA FIRMA ORIGINAL DE QUIEN REVISÓ Y APROBÓ, Y EL SELLO.