



# ENSAYO LL Y LP + WN + PESO UNITARIO

Código: FR-IN-20

Versión: 1

Controlado: SI (X) NO ( )

Vigencia: 14/06/2016

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Proyecto 300-18 HOSPITAL CEMOSA

Ciente CEMOSA

Localización HOSPITAL SUBA

Sondeo

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Fecha 13/03/2019

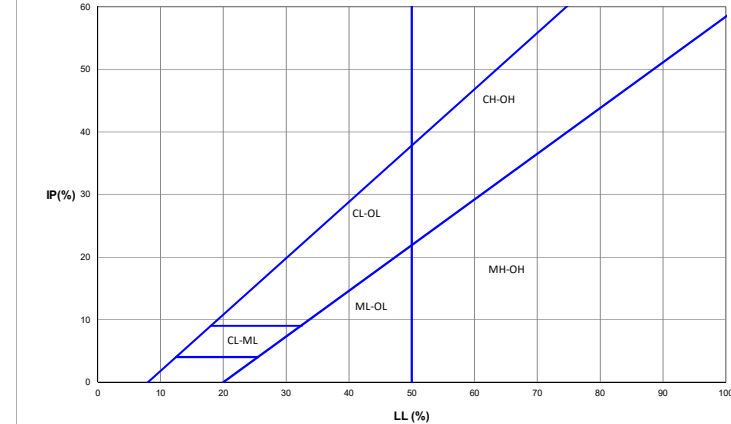
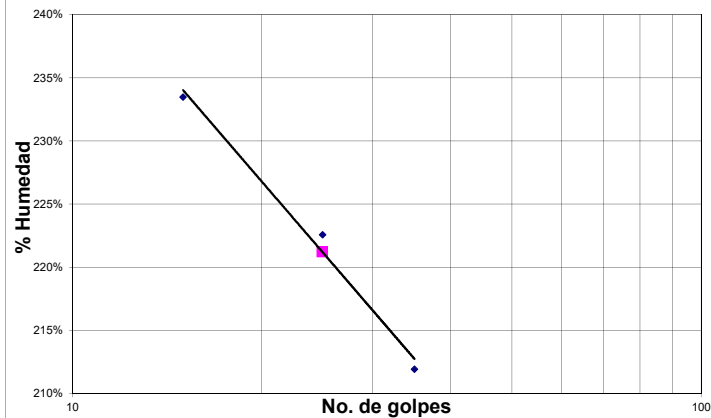
Muestra M 1

Profundidad 1.00 m 1.50 m

| Recipiente                | No. | HUMEDAD W <sub>n</sub> | LIMITE LIQUIDO LL |         |         |        | LIMITE PLASTICO LP |  |
|---------------------------|-----|------------------------|-------------------|---------|---------|--------|--------------------|--|
|                           |     | Z14                    | 24L               | 37L     | B4      | 28P    | 16P                |  |
| Peso recipiente           | g   | 40.91                  | 12.53             | 12.56   | 12.53   | 6.73   | 6.77               |  |
| Muestra humeda+recipiente | g   | 180.96                 | 51.78             | 51.72   | 51.77   | 16.42  | 16.30              |  |
| Muestra seca + recipiente | g   | 104.56                 | 24.30             | 24.70   | 25.11   | 13.25  | 13.16              |  |
| Muestra humeda            | g   | 140.05                 | 39.25             | 39.16   | 39.24   | 9.69   | 9.53               |  |
| Muestra seca              | g   | 63.65                  | 11.77             | 12.14   | 12.58   | 6.52   | 6.39               |  |
| Humedad                   | %   | 120.03%                | 233.47%           | 222.57% | 211.92% | 48.62% | 49.14%             |  |
| No. de golpes             |     |                        | 15                | 25      | 35      |        |                    |  |

| Peso Unitario Total                     |                   |        |
|-----------------------------------------|-------------------|--------|
| Muestra inicial                         | g                 | 71.35  |
| Muestra parafinada en el aire + Soporte | g                 | 193.48 |
| Muestra parafinada sumergida + Soporte  | g                 | 138.37 |
| Peso del Soporte                        | g                 | 120.30 |
| Muestra Parafina sumergida              | g                 | 18.07  |
| Peso Unitario Total                     | g/cm <sup>3</sup> | 1.34   |

|                                         |         |
|-----------------------------------------|---------|
| LIMITE LIQUIDO                          | 221.20% |
| LIMITE PLÁSTICO                         | 48.88%  |
| INDICE DE PLASTICIDAD                   | 172.32% |
| INDICE DE LIQUIDEZ                      | 0.41    |
| INDICE DE CONSISTENCIA                  | 0.59    |
| HUMEDAD NATURAL                         | 120.03% |
| PESO UNITARIO TOTAL (g/m <sup>3</sup> ) | 1.34    |
| PESO UNITARIO SECO                      | 0.61    |



Laboratorista JOSE PABUENA

Revisado y Aprobado:

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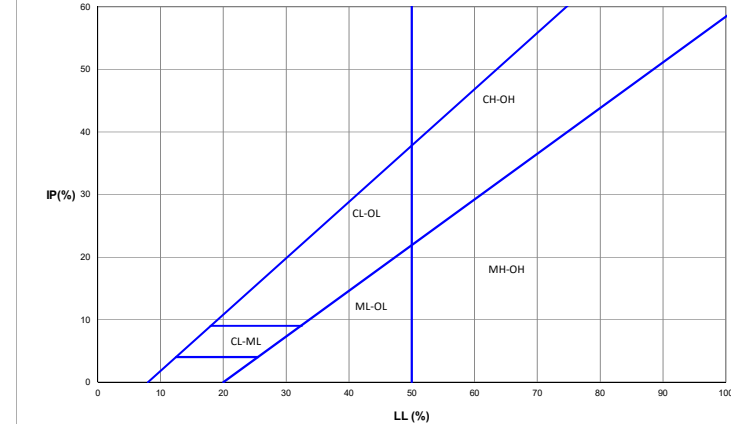
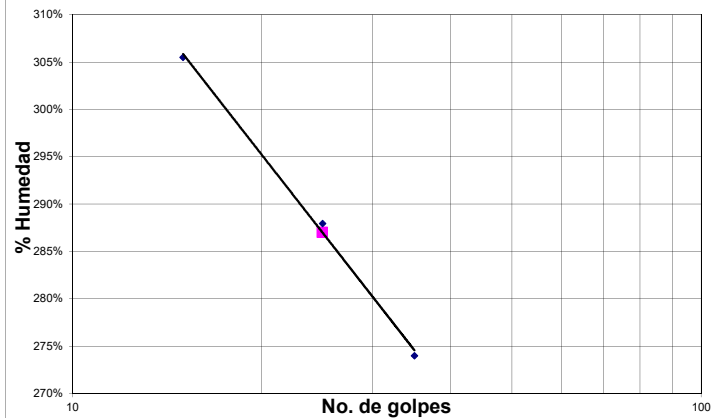
Muestra M 3

Profundidad 2.00 m 2.50 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         |  | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--|--------------------|--------|
|                           |     | Z18        | Y3      | Y7                | Y10     |  | 26P                | 25P    |
| Peso recipiente           | g   | 41.24      | 12.76   | 12.68             | 12.63   |  | 7.07               | 6.67   |
| Muestra humeda+recipiente | g   | 185.02     | 53.59   | 53.57             | 53.62   |  | 18.93              | 19.07  |
| Muestra seca + recipiente | g   | 102.16     | 22.83   | 23.22             | 23.59   |  | 14.90              | 14.80  |
| Muestra humeda            | g   | 143.78     | 40.83   | 40.89             | 40.99   |  | 11.86              | 12.40  |
| Muestra seca              | g   | 60.92      | 10.07   | 10.54             | 10.96   |  | 7.83               | 8.13   |
| Humedad                   | %   | 136.01%    | 305.46% | 287.95%           | 274.00% |  | 51.47%             | 52.52% |
| No. de golpes             |     |            | 15      | 25                | 35      |  |                    |        |

| Peso Unitario Total                     |       |        |  |
|-----------------------------------------|-------|--------|--|
| Muestra inicial                         | g     | 59.19  |  |
| Muestra parafinada en el aire + Soporte | g     | 180.48 |  |
| Muestra parafinada sumergida + Soporte  | g     | 133.34 |  |
| Peso del Soporte                        | g     | 120.30 |  |
| Muestra Parafina sumergida              | g     | 13.04  |  |
| Peso Unitario Total                     | g/cm3 | 1.29   |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 286.99% |
| LIMITE PLÁSTICO            | 52.00%  |
| INDICE DE PLASTICIDAD      | 235.00% |
| INDICE DE LIQUEZ           | 0.36    |
| INDICE DE CONSISTENCIA     | 0.64    |
| HUMEDAD NATURAL            | 136.01% |
| PESO UNITARIO TOTAL (g/m3) | 1.29    |
| PESO UNITARIO SECO         | 0.54    |



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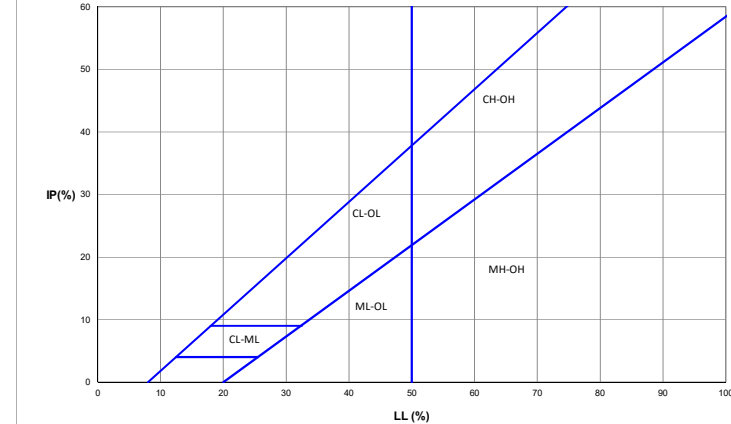
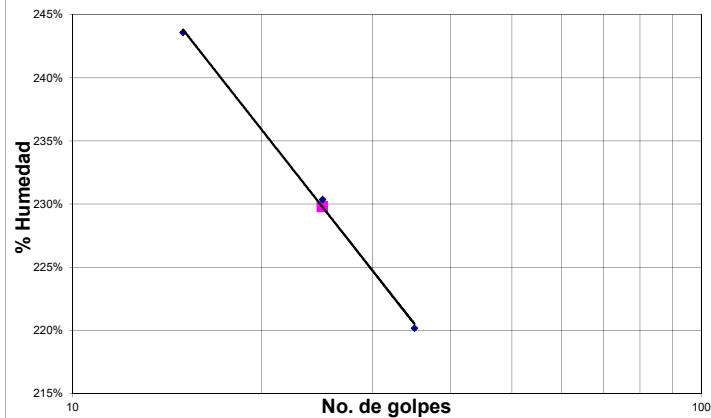
Muestra M 5

Profundidad 3.00 m 3.50 m

| Recipiente                | No. | HUMEDAD Wn | LIMITE LIQUIDO LL |         |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|-------------------|---------|---------|--------------------|--------|
|                           |     | Z6         | 1L                | Y12     | Y2      | 2P                 | 18P    |
| Peso recipiente           | g   | 39.36      | 12.64             | 12.61   | 12.68   | 6.69               | 6.74   |
| Muestra humeda+recipiente | g   | 230.64     | 47.65             | 47.66   | 47.61   | 19.25              | 19.07  |
| Muestra seca + recipiente | g   | 126.68     | 22.83             | 23.22   | 23.59   | 14.90              | 14.80  |
| Muestra humeda            | g   | 191.28     | 35.01             | 35.05   | 34.93   | 12.56              | 12.33  |
| Muestra seca              | g   | 87.32      | 10.19             | 10.61   | 10.91   | 8.21               | 8.06   |
| Humedad                   | %   | 119.06%    | 243.57%           | 230.35% | 220.16% | 52.98%             | 52.98% |
| No. de golpes             |     |            | 15                | 25      | 35      |                    |        |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 229.76% |
| LIMITE PLÁSTICO            | 52.98%  |
| INDICE DE PLASTICIDAD      | 176.78% |
| INDICE DE LIQUEZ           | 0.37    |
| INDICE DE CONSISTENCIA     | 0.63    |
| HUMEDAD NATURAL            | 119.06% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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Muestra M 7

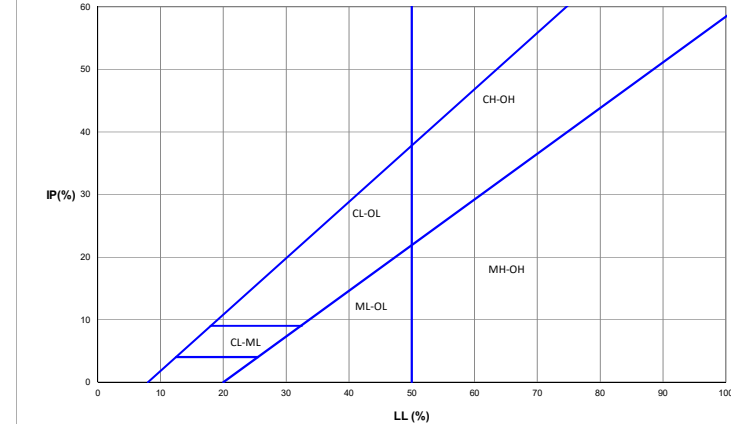
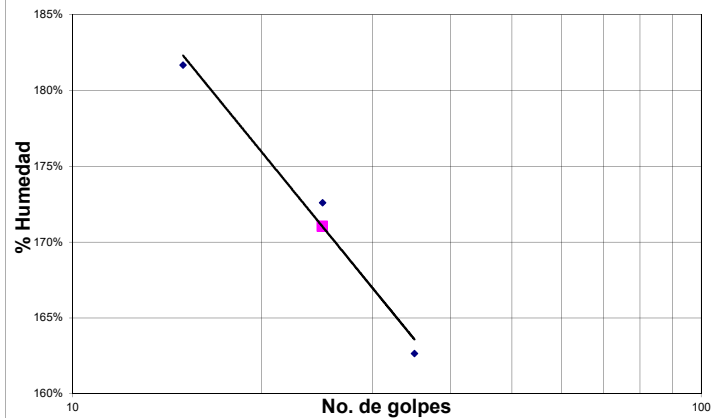
Profundidad

4.00 m 4.50 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--------------------|--------|
|                           |     | Z2         | 31      | 20                | 26      | 7P                 | 23P    |
| Peso recipiente           | g   | 37.71      | 16.22   | 16.25             | 16.18   | 6.77               | 6.91   |
| Muestra humeda+recipiente | g   | 216.06     | 54.95   | 54.93             | 54.97   | 17.09              | 17.97  |
| Muestra seca + recipiente | g   | 116.90     | 29.97   | 30.44             | 30.95   | 13.68              | 14.29  |
| Muestra humeda            | g   | 178.35     | 38.73   | 38.68             | 38.79   | 10.32              | 11.06  |
| Muestra seca              | g   | 79.19      | 13.75   | 14.19             | 14.77   | 6.91               | 7.38   |
| Humedad                   | %   | 125.22%    | 181.67% | 172.59%           | 162.63% | 49.35%             | 49.86% |
| No. de golpes             |     |            | 15      | 25                | 35      |                    |        |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 171.01% |
| LIMITE PLÁSTICO            | 49.61%  |
| INDICE DE PLASTICIDAD      | 121.40% |
| INDICE DE LIQUIDEZ         | 0.62    |
| INDICE DE CONSISTENCIA     | 0.38    |
| HUMEDAD NATURAL            | 125.22% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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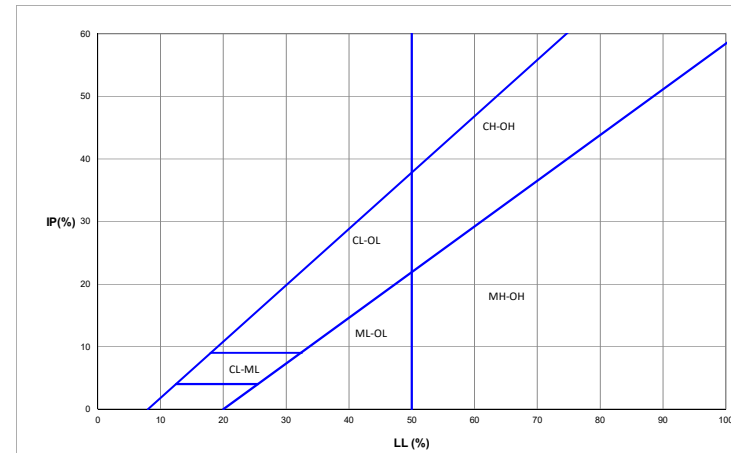
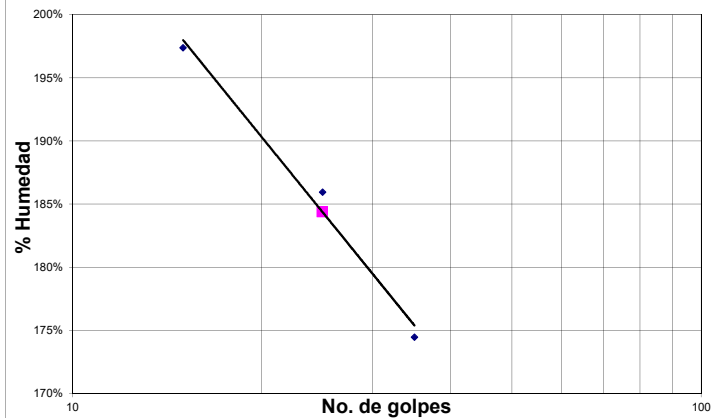
Muestra M 9

Profundidad 5.50 m 6.00 m

| Recipiente                | No. | HUMEDAD W <sub>n</sub> |         | LIMITE LIQUIDO LL |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------------------|---------|-------------------|---------|--------------------|--------|
|                           |     | Z11                    | 42L     | Y11               | Y4      | 6P                 | 21P    |
| Peso recipiente           | g   | 40.73                  | 12.30   | 12.36             | 12.35   | 6.73               | 6.35   |
| Muestra humeda+recipiente | g   | 202.60                 | 54.08   | 54.02             | 54.04   | 18.74              | 17.65  |
| Muestra seca + recipiente | g   | 99.17                  | 26.35   | 26.93             | 27.54   | 14.68              | 13.84  |
| Muestra humeda            | g   | 161.87                 | 41.78   | 41.66             | 41.69   | 12.01              | 11.30  |
| Muestra seca              | g   | 58.44                  | 14.05   | 14.57             | 15.19   | 7.95               | 7.49   |
| Humedad                   | %   | 176.98%                | 197.37% | 185.93%           | 174.46% | 51.07%             | 50.87% |
| No. de golpes             |     |                        | 15      | 25                | 35      |                    |        |

| Peso Unitario Total                     |       |        |
|-----------------------------------------|-------|--------|
| Muestra inicial                         | g     | 57.98  |
| Muestra parafinada en el aire + Soporte | g     | 179.77 |
| Muestra parafinada sumergida + Soporte  | g     | 135.04 |
| Peso del Soporte                        | g     | 120.30 |
| Muestra Parafina sumergida              | g     | 14.74  |
| Peso Unitario Total                     | g/cm3 | 1.35   |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 184.37% |
| LIMITE PLÁSTICO            | 50.97%  |
| INDICE DE PLASTICIDAD      | 133.40% |
| INDICE DE LIQUIDEZ         | 0.94    |
| INDICE DE CONSISTENCIA     | 0.06    |
| HUMEDAD NATURAL            | 176.98% |
| PESO UNITARIO TOTAL (g/m3) | 1.35    |
| PESO UNITARIO SECO         | 0.49    |



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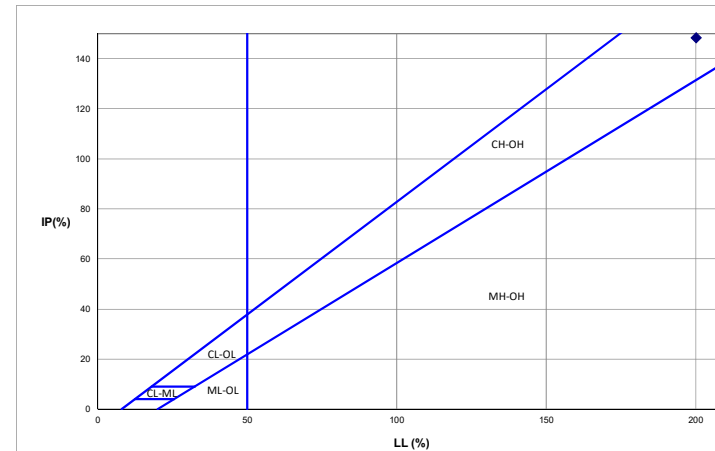
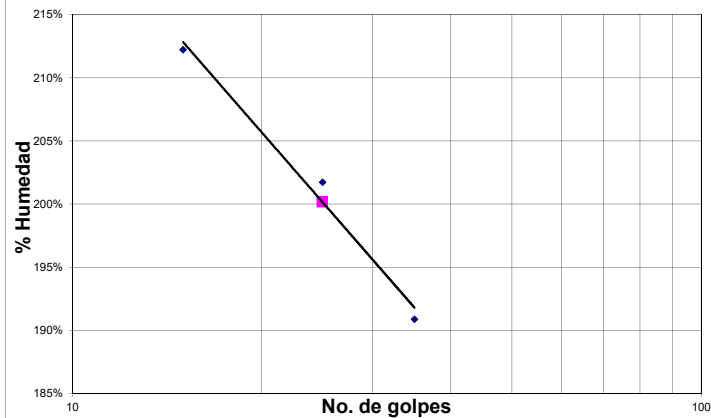
Muestra M 11

Profundidad 7.40 m 8.00 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--------------------|--------|
|                           |     | Z13        | B3      | Y24               | 26L     | 14P                | 1P     |
| Peso recipiente           | g   | 37.64      | 12.83   | 12.88             | 12.83   | 6.93               | 6.78   |
| Muestra humeda+recipiente | g   | 208.35     | 53.26   | 53.22             | 53.26   | 18.47              | 18.35  |
| Muestra seca + recipiente | g   | 100.72     | 25.78   | 26.25             | 26.73   | 14.52              | 14.41  |
| Muestra humeda            | g   | 170.71     | 40.43   | 40.34             | 40.43   | 11.54              | 11.57  |
| Muestra seca              | g   | 63.08      | 12.95   | 13.37             | 13.90   | 7.59               | 7.63   |
| Humedad                   | %   | 170.62%    | 212.20% | 201.72%           | 190.86% | 52.04%             | 51.64% |
| No. de golpes             |     |            | 15      | 25                | 35      |                    |        |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 200.15% |
| LIMITE PLÁSTICO            | 51.84%  |
| INDICE DE PLASTICIDAD      | 148.31% |
| INDICE DE LIQUEZ           | 0.80    |
| INDICE DE CONSISTENCIA     | 0.20    |
| HUMEDAD NATURAL            | 170.62% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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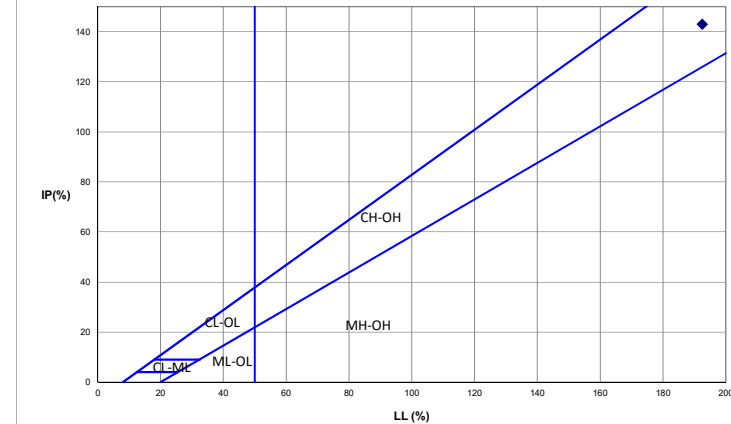
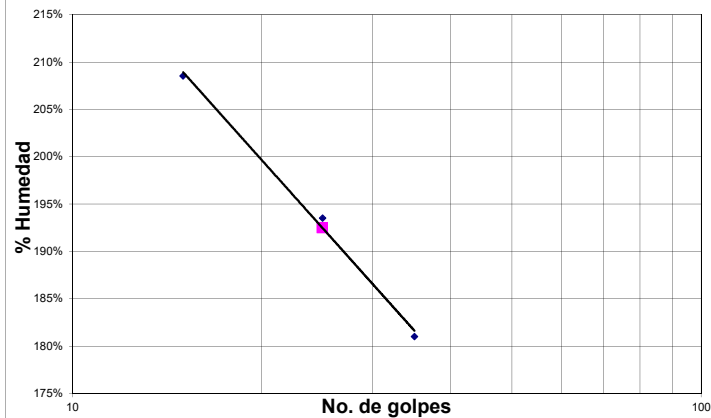
Muestra M 12

Profundidad 8.40 m 9.00 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--------------------|--------|
|                           |     | Z15        | Y13     | 8L                | 15      | 36                 | 100    |
| Peso recipiente           | g   | 39.33      | 12.99   | 13.00             | 12.92   | 8.78               | 8.86   |
| Muestra humeda+recipiente | g   | 230.63     | 52.85   | 52.83             | 52.88   | 21.55              | 21.15  |
| Muestra seca + recipiente | g   | 123.94     | 25.91   | 26.57             | 27.14   | 17.32              | 17.08  |
| Muestra humeda            | g   | 191.30     | 39.86   | 39.83             | 39.96   | 12.77              | 12.29  |
| Muestra seca              | g   | 84.61      | 12.92   | 13.57             | 14.22   | 8.54               | 8.22   |
| Humedad                   | %   | 126.10%    | 208.51% | 193.52%           | 181.01% | 49.53%             | 49.51% |
| No. de golpes             |     |            | 15      | 25                | 35      |                    |        |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 192.48% |
| LIMITE PLÁSTICO            | 49.52%  |
| INDICE DE PLASTICIDAD      | 142.95% |
| INDICE DE LIQUIDEZ         | 0.54    |
| INDICE DE CONSISTENCIA     | 0.46    |
| HUMEDAD NATURAL            | 126.10% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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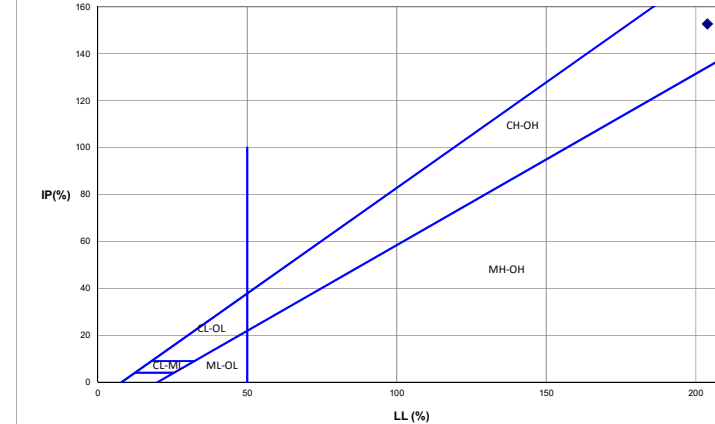
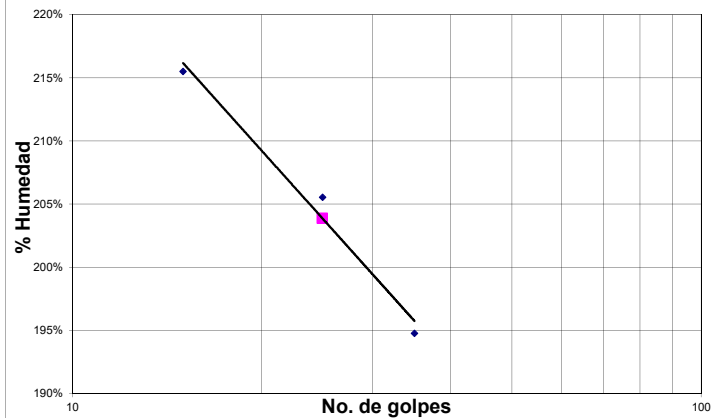
Muestra M 1

Profundidad 0.30 m 0.90 m

| Recipiente                | No. | HUMEDAD W <sub>n</sub> | LIMITE LIQUIDO LL |         |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------------------|-------------------|---------|---------|--------------------|--------|
|                           |     | z8                     | 14                | 111     | 421     | 18                 | 31     |
| Peso recipiente           | g   | 40.58                  | 12.24             | 12.31   | 12.26   | 8.82               | 9.35   |
| Muestra humeda+recipiente | g   | 203.42                 | 53.76             | 53.77   | 53.79   | 19.99              | 20.10  |
| Muestra seca + recipiente | g   | 126.99                 | 25.40             | 25.88   | 26.35   | 16.22              | 16.45  |
| Muestra humeda            | g   | 162.84                 | 41.52             | 41.46   | 41.53   | 11.17              | 10.75  |
| Muestra seca              | g   | 86.41                  | 13.16             | 13.57   | 14.09   | 7.40               | 7.10   |
| Humedad                   | %   | 88.45%                 | 215.50%           | 205.53% | 194.75% | 50.95%             | 51.41% |
| No. de golpes             |     |                        | 15                | 25      | 35      |                    |        |

| Peso Unitario Total                     |       |        |
|-----------------------------------------|-------|--------|
| Muestra inicial                         | g     | 43.76  |
| Muestra parafinada en el aire + Soporte | g     | 165.16 |
| Muestra parafinada sumergida + Soporte  | g     | 131.40 |
| Peso del Soporte                        | g     | 120.30 |
| Muestra Parafina sumergida              | g     | 11.10  |
| Peso Unitario Total                     | g/cm3 | 1.34   |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 203.86% |
| LIMITE PLÁSTICO            | 51.18%  |
| INDICE DE PLASTICIDAD      | 152.68% |
| INDICE DE LIQUEZ           | 0.24    |
| INDICE DE CONSISTENCIA     | 0.76    |
| HUMEDAD NATURAL            | 88.45%  |
| PESO UNITARIO TOTAL (g/m3) | 1.34    |
| PESO UNITARIO SECO         | 0.71    |



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# ENSAYO LL Y LP + WN + PESO UNITARIO

Código: FR-IN-20

Versión: 1

Controlado: SI (X) NO ( )

Vigencia: 14/06/2016

Página: 1 de 1

Proyecto 300-18 HOSPITAL CEMOSA

Ciente CEMOSA

Localización HOSPITAL SUBA

Sondeo

SM-1

Fecha 13/03/2019

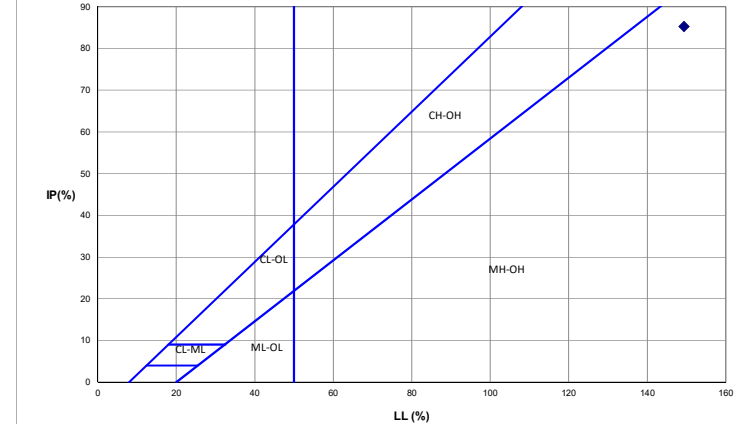
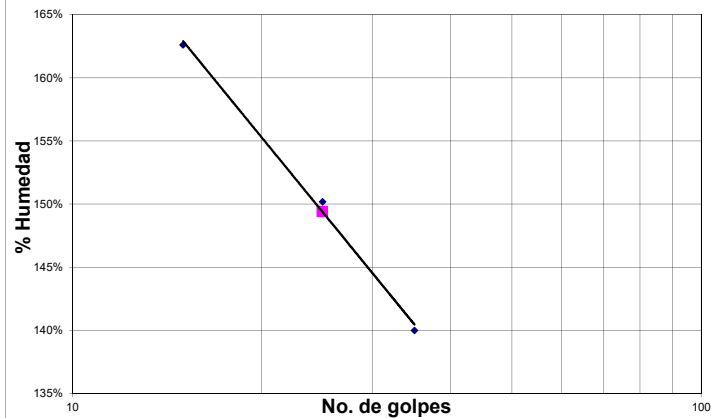
Muestra M 3

Profundidad 1.50 m 2.10 m

| Recipiente                | No. | HUMEDAD W <sub>n</sub> | LIMITE LIQUIDO LL |         |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------------------|-------------------|---------|---------|--------------------|--------|
|                           |     | Z12                    | 17                | 13      | 110     | 14P                | 2P     |
| Peso recipiente           | g   | 37.38                  | 12.73             | 12.74   | 12.64   | 6.92               | 6.69   |
| Muestra humeda+recipiente | g   | 178.81                 | 55.19             | 55.17   | 55.19   | 16.86              | 16.46  |
| Muestra seca + recipiente | g   | 103.69                 | 28.90             | 29.70   | 30.37   | 12.98              | 12.64  |
| Muestra humeda            | g   | 141.43                 | 42.46             | 42.43   | 42.55   | 9.94               | 9.77   |
| Muestra seca              | g   | 66.31                  | 16.17             | 16.96   | 17.73   | 6.06               | 5.95   |
| Humedad                   | %   | 113.29%                | 162.59%           | 150.18% | 139.99% | 64.03%             | 64.20% |
| No. de golpes             |     |                        | 15                | 25      | 35      |                    |        |

| Peso Unitario Total                     |       |        |
|-----------------------------------------|-------|--------|
| Muestra inicial                         | g     | 86.69  |
| Muestra parafinada en el aire + Soporte | g     | 211.97 |
| Muestra parafinada sumergida + Soporte  | g     | 146.52 |
| Peso del Soporte                        | g     | 120.30 |
| Muestra Parafina sumergida              | g     | 26.22  |
| Peso Unitario Total                     | g/cm3 | 1.45   |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 149.38% |
| LIMITE PLÁSTICO            | 64.11%  |
| INDICE DE PLASTICIDAD      | 85.26%  |
| INDICE DE LIQUIDEZ         | 0.58    |
| INDICE DE CONSISTENCIA     | 0.42    |
| HUMEDAD NATURAL            | 113.29% |
| PESO UNITARIO TOTAL (g/m3) | 1.45    |
| PESO UNITARIO SECO         | 0.68    |



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# ENSAYO LL Y LP + WN + PESO UNITARIO

Código: FR-IN-20

Versión: 1

Controlado: SI (X) NO ( )

Vigencia: 14/06/2016

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Proyecto 300-18 HOSPITAL CEMOSA

Ciente CEMOSA

Localización HOSPITAL SUBA

Sondeo

SM-1

Fecha 13/03/2019

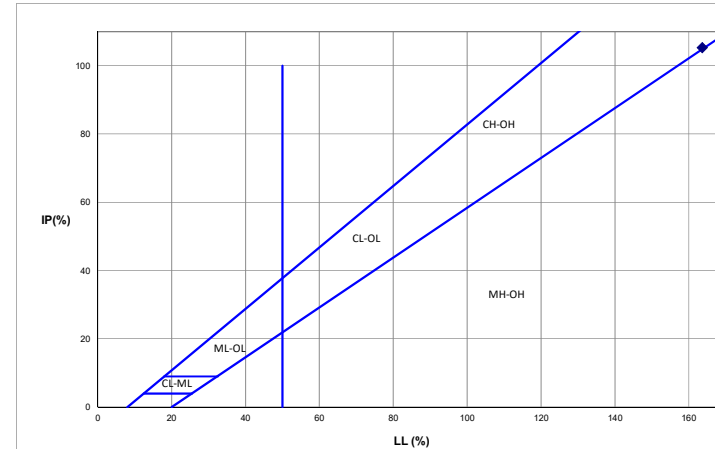
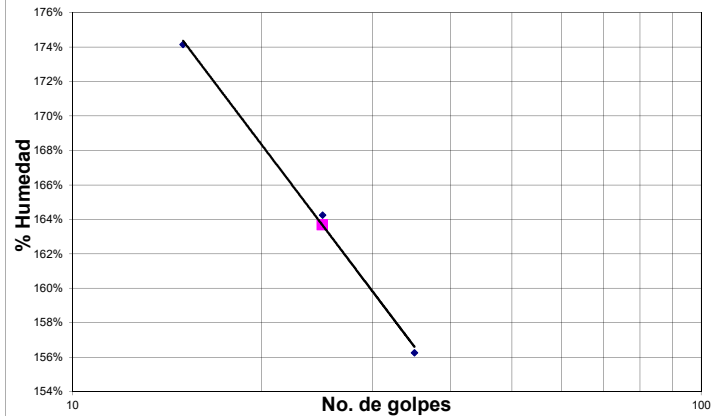
Muestra M 5

Profundidad 2.70 m 3.30 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--------------------|--------|
|                           |     | Z9         | B4      | 37L               | 24L     | 5P                 | 26P    |
| Peso recipiente           | g   | 38.84      | 12.53   | 12.55             | 12.54   | 6.74               | 7.07   |
| Muestra humeda+recipiente | g   | 177.53     | 55.35   | 55.33             | 55.36   | 17.57              | 17.01  |
| Muestra seca + recipiente | g   | 94.27      | 28.15   | 28.74             | 29.25   | 13.57              | 13.36  |
| Muestra humeda            | g   | 138.69     | 42.82   | 42.78             | 42.82   | 10.83              | 9.94   |
| Muestra seca              | g   | 55.43      | 15.62   | 16.19             | 16.71   | 6.83               | 6.29   |
| Humedad                   | %   | 150.21%    | 174.14% | 164.24%           | 156.25% | 58.57%             | 58.03% |
| No. de golpes             |     |            | 15      | 25                | 35      |                    |        |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 163.66% |
| LIMITE PLÁSTICO            | 58.30%  |
| INDICE DE PLASTICIDAD      | 105.36% |
| INDICE DE LIQUEZ           | 0.87    |
| INDICE DE CONSISTENCIA     | 0.13    |
| HUMEDAD NATURAL            | 150.21% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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# ENSAYO LL Y LP + WN + PESO UNITARIO

Código: FR-IN-20

Versión: 1

Controlado: SI (X) NO ( )

Vigencia: 14/06/2016

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Proyecto 300-18 HOSPITAL CEMOSA

Ciente CEMOSA

Localización HOSPITAL SUBA

Sondeo

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Fecha 13/03/2019

Muestra M 7

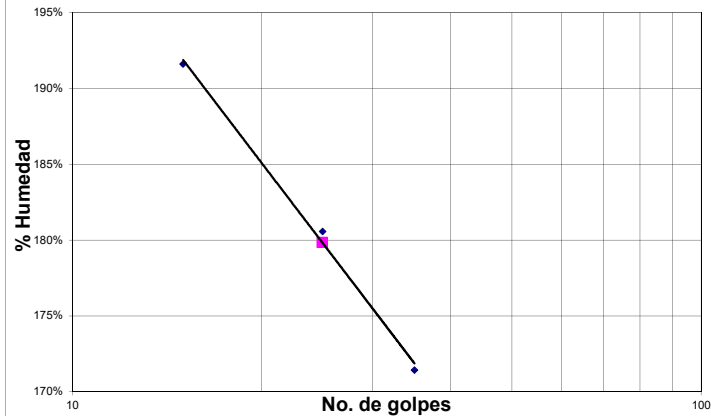
Profundidad

3.50 m 4.50 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         |  | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--|--------------------|--------|
|                           |     | Z26        | 12      | 112               | 11      |  | 19P                | 47P    |
| Peso recipiente           | g   | 39.54      | 12.67   | 12.61             | 12.64   |  | 7.05               | 6.81   |
| Muestra humeda+recipiente | g   | 158.79     | 54.28   | 54.30             | 54.33   |  | 17.95              | 17.41  |
| Muestra seca + recipiente | g   | 90.42      | 26.94   | 27.47             | 28.00   |  | 13.94              | 13.50  |
| Muestra humeda            | g   | 119.25     | 41.61   | 41.69             | 41.69   |  | 10.90              | 10.60  |
| Muestra seca              | g   | 50.88      | 14.27   | 14.86             | 15.36   |  | 6.89               | 6.69   |
| Humedad                   | %   | 134.38%    | 191.59% | 180.55%           | 171.42% |  | 58.20%             | 58.45% |
| No. de golpes             |     |            | 15      | 25                | 35      |  |                    |        |

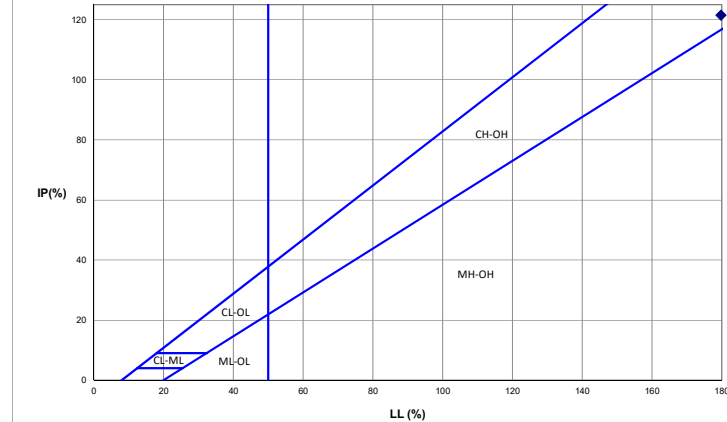
| Peso Unitario Total                     |       |  |  |
|-----------------------------------------|-------|--|--|
| Muestra inicial                         | g     |  |  |
| Muestra parafinada en el aire + Soporte | g     |  |  |
| Muestra parafinada sumergida + Soporte  | g     |  |  |
| Peso del Soporte                        | g     |  |  |
| Muestra Parafina sumergida              | g     |  |  |
| Peso Unitario Total                     | g/cm3 |  |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 179.81% |
| LIMITE PLÁSTICO            | 58.32%  |
| INDICE DE PLASTICIDAD      | 121.49% |
| INDICE DE LIQUEZ           | 0.63    |
| INDICE DE CONSISTENCIA     | 0.37    |
| HUMEDAD NATURAL            | 134.38% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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# ENSAYO LL Y LP + WN + PESO UNITARIO

Código: FR-IN-20

Versión: 1

Controlado: SI (X) NO ( )

Vigencia: 14/06/2016

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Proyecto 300-18 HOSPITAL CEMOSA

Ciente CEMOSA

Localización HOSPITAL SUBA

Sondeo

SM-1

Fecha 13/03/2019

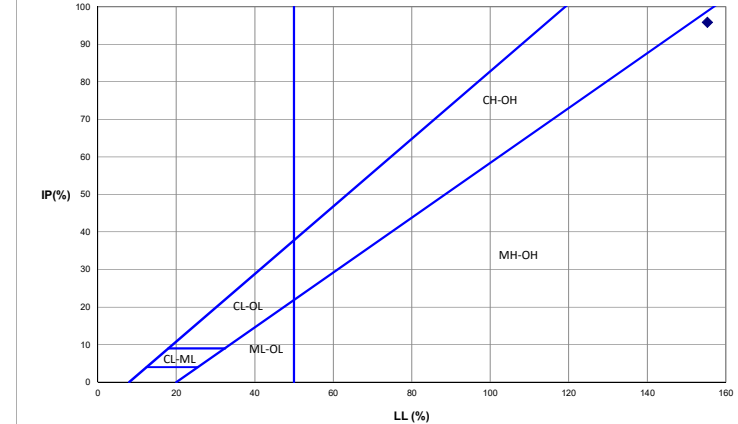
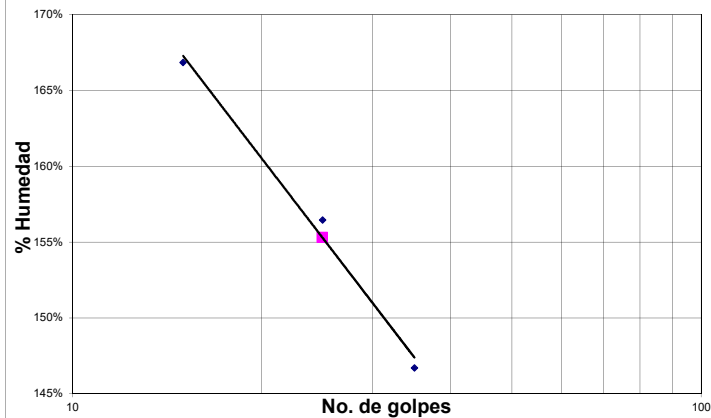
Muestra M 8

Profundidad 4.50 m 5.10 m

| Recipiente                | No. | HUMEDAD Wn |         | LIMITE LIQUIDO LL |         | LIMITE PLASTICO LP |        |
|---------------------------|-----|------------|---------|-------------------|---------|--------------------|--------|
|                           |     | Z25        | B3      | 124               | 36L     | 19                 | 100    |
| Peso recipiente           | g   | 38.14      | 12.83   | 12.88             | 12.84   | 8.72               | 8.83   |
| Muestra humeda+recipiente | g   | 181.84     | 52.72   | 52.73             | 52.68   | 19.49              | 19.47  |
| Muestra seca + recipiente | g   | 89.96      | 27.78   | 28.42             | 28.99   | 15.46              | 15.52  |
| Muestra humeda            | g   | 143.70     | 39.89   | 39.85             | 39.84   | 10.77              | 10.64  |
| Muestra seca              | g   | 51.82      | 14.95   | 15.54             | 16.15   | 6.74               | 6.69   |
| Humedad                   | %   | 177.31%    | 166.82% | 156.44%           | 146.69% | 59.79%             | 59.04% |
| No. de golpes             |     |            | 15      | 25                | 35      |                    |        |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 155.28% |
| LIMITE PLÁSTICO            | 59.42%  |
| INDICE DE PLASTICIDAD      | 95.87%  |
| INDICE DE LIQUEZ           | 1.23    |
| INDICE DE CONSISTENCIA     | -0.23   |
| HUMEDAD NATURAL            | 177.31% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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# ENSAYO LL Y LP + WN + PESO UNITARIO

Código: FR-IN-20

Versión: 1

Controlado: SI (X) NO ( )

Vigencia: 14/06/2016

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Proyecto 300-18 HOSPITAL CEMOSA

Ciente CEMOSA

Localización HOSPITAL SUBA

Sondeo

SM-01

Fecha 13/03/2019

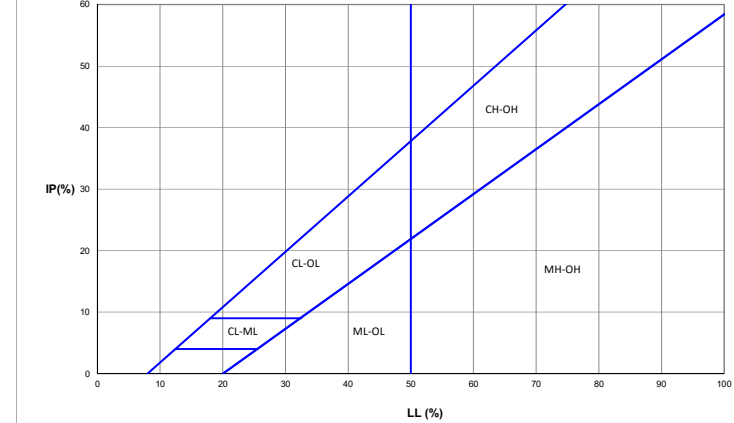
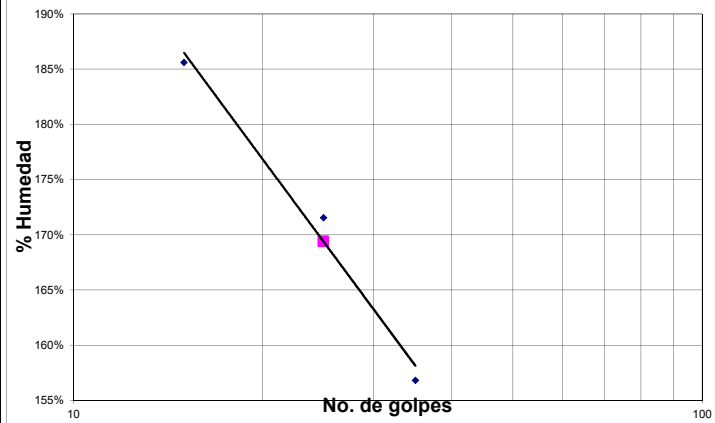
Muestra M 10

Profundidad 6.40 m 7.00 m

|                           |     | HUMEDAD Wn | LIMITE LIQUIDO LL |         |         |        | LIMITE PLASTICO LP |  |
|---------------------------|-----|------------|-------------------|---------|---------|--------|--------------------|--|
| Recipiente                | No. | Z24        | 26                | 20      | 31      | 25P    | 46P                |  |
| Peso recipiente           | g   | 37.56      | 16.19             | 16.26   | 16.22   | 6.67   | 6.89               |  |
| Muestra humeda+recipiente | g   | 168.08     | 53.52             | 53.49   | 53.46   | 18.30  | 19.18              |  |
| Muestra seca + recipiente | g   | 87.39      | 29.26             | 29.97   | 30.72   | 14.22  | 14.89              |  |
| Muestra humeda            | g   | 130.52     | 37.33             | 37.23   | 37.24   | 11.63  | 12.29              |  |
| Muestra seca              | g   | 49.83      | 13.07             | 13.71   | 14.50   | 7.55   | 8.00               |  |
| Humedad                   | %   | 161.93%    | 185.62%           | 171.55% | 156.83% | 54.04% | 53.63%             |  |
| No. de golpes             |     |            | 15                | 25      | 35      |        |                    |  |

| Peso Unitario Total                     |       |  |
|-----------------------------------------|-------|--|
| Muestra inicial                         | g     |  |
| Muestra parafinada en el aire + Soporte | g     |  |
| Muestra parafinada sumergida + Soporte  | g     |  |
| Peso del Soporte                        | g     |  |
| Muestra Parafina sumergida              | g     |  |
| Peso Unitario Total                     | g/cm3 |  |

|                            |         |
|----------------------------|---------|
| LIMITE LIQUIDO             | 169.39% |
| LIMITE PLÁSTICO            | 53.83%  |
| INDICE DE PLASTICIDAD      | 115.56% |
| INDICE DE LIQUEDEZ         | 0.94    |
| INDICE DE CONSISTENCIA     | 0.06    |
| HUMEDAD NATURAL            | 161.93% |
| PESO UNITARIO TOTAL (g/m3) |         |
| PESO UNITARIO SECO         |         |



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|                                                                                   |                      |                |
|-----------------------------------------------------------------------------------|----------------------|----------------|
|  | <b>HUMEDADES</b>     |                |
|                                                                                   | Código: FR-IN-24     | Versión: 1     |
| Controlado: SI (X) NO ( )                                                         | Vigencia: 14/06/2016 | Página: 1 de 1 |

PROYECTO: 300-18 HOSPITAL CEMOSA

CLIENTE: CEMOSA

LOCALIZACIÓN: HOSPITAL SUBA

FECHA DE ENTREGA DE RESULTADOS: 11/02/2017

|                                 |         |         |         |         |         |         |         |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Sondeo                          | SM-01   | SM-01   | SM-02   | SM-02   | SM-02   | SM-02   | SM-02   |
| Muestra                         | 10      | 1       | 3       | 5       | 7       | 9       | 11      |
| Profundidad (m)                 | 6.4 - 7 | 1 - 1.5 | 2 - 2.5 | 3 - 3.5 | 4 - 4.5 | 5.5 - 6 | 7.4 - 8 |
| Recipiente                      | Z24     | Z14     | Z18     | Z6      | Z2      | Z11     | Z13     |
| Peso de Recipiente (g)          | 37.56   | 40.91   | 41.24   | 39.36   | 37.71   | 40.73   | 37.64   |
| Muestra Húmeda + recipiente (g) | 168.08  | 180.96  | 185.02  | 230.64  | 216.06  | 202.60  | 208.35  |
| Muestra seca + recipiente (g)   | 87.39   | 104.56  | 102.16  | 126.68  | 116.90  | 99.17   | 100.72  |
| Muestra Húmeda (g)              | 130.52  | 140.05  | 143.78  | 191.28  | 178.35  | 161.87  | 170.71  |
| Muestra seca (g)                | 49.83   | 63.65   | 60.92   | 87.32   | 79.19   | 58.44   | 63.08   |
| Humedad Natural (%)             | 161.93% | 120.03% | 136.01% | 119.06% | 125.22% | 176.98% | 170.62% |

|                                 |         |           |           |           |           |           |  |
|---------------------------------|---------|-----------|-----------|-----------|-----------|-----------|--|
| Sondeo                          | SM-02   | SM-1      | SM-1      | SM-1      | SM-1      | SM-1      |  |
| Muestra                         | 12      | 1         | 3         | 5         | 7         | 8         |  |
| Profundidad (m)                 | 8.4 - 9 | 0.3 - 0.9 | 1.5 - 2.1 | 2.7 - 3.3 | 3.5 - 4.5 | 4.5 - 5.1 |  |
| Recipiente                      | Z15     | Z8        | Z12       | Z9        | Z26       | Z25       |  |
| Peso de Recipiente (g)          | 39.33   | 40.58     | 37.38     | 38.84     | 39.54     | 38.14     |  |
| Muestra Húmeda + recipiente (g) | 230.63  | 203.42    | 178.81    | 177.53    | 158.79    | 181.84    |  |
| Muestra seca + recipiente (g)   | 123.94  | 126.99    | 103.69    | 94.27     | 90.42     | 89.96     |  |
| Muestra Húmeda (g)              | 191.30  | 162.84    | 141.43    | 138.69    | 119.25    | 143.70    |  |
| Muestra seca (g)                | 84.61   | 86.41     | 66.31     | 55.43     | 50.88     | 51.82     |  |
| Humedad Natural (%)             | 126.10% | 88.45%    | 113.29%   | 150.21%   | 134.38%   | 177.31%   |  |

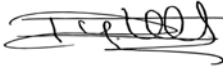
|                                 |  |  |  |  |  |  |  |
|---------------------------------|--|--|--|--|--|--|--|
| Sondeo                          |  |  |  |  |  |  |  |
| Muestra                         |  |  |  |  |  |  |  |
| Profundidad (m)                 |  |  |  |  |  |  |  |
| Recipiente                      |  |  |  |  |  |  |  |
| Peso de Recipiente (g)          |  |  |  |  |  |  |  |
| Muestra Húmeda + recipiente (g) |  |  |  |  |  |  |  |
| Muestra seca + recipiente (g)   |  |  |  |  |  |  |  |
| Muestra Húmeda (g)              |  |  |  |  |  |  |  |
| Muestra seca (g)                |  |  |  |  |  |  |  |
| Humedad Natural (%)             |  |  |  |  |  |  |  |

|                                 |  |  |  |  |  |  |  |
|---------------------------------|--|--|--|--|--|--|--|
| Sondeo                          |  |  |  |  |  |  |  |
| Muestra                         |  |  |  |  |  |  |  |
| Profundidad (m)                 |  |  |  |  |  |  |  |
| Recipiente                      |  |  |  |  |  |  |  |
| Peso de Recipiente (g)          |  |  |  |  |  |  |  |
| Muestra Húmeda + recipiente (g) |  |  |  |  |  |  |  |
| Muestra seca + recipiente (g)   |  |  |  |  |  |  |  |
| Muestra Húmeda (g)              |  |  |  |  |  |  |  |
| Muestra seca (g)                |  |  |  |  |  |  |  |
| Humedad Natural (%)             |  |  |  |  |  |  |  |

|                                 |  |  |  |  |  |  |  |
|---------------------------------|--|--|--|--|--|--|--|
| Sondeo                          |  |  |  |  |  |  |  |
| Muestra                         |  |  |  |  |  |  |  |
| Profundidad (m)                 |  |  |  |  |  |  |  |
| Recipiente                      |  |  |  |  |  |  |  |
| Peso de Recipiente (g)          |  |  |  |  |  |  |  |
| Muestra Húmeda + recipiente (g) |  |  |  |  |  |  |  |
| Muestra seca + recipiente (g)   |  |  |  |  |  |  |  |
| Muestra Húmeda (g)              |  |  |  |  |  |  |  |
| Muestra seca (g)                |  |  |  |  |  |  |  |
| Humedad Natural (%)             |  |  |  |  |  |  |  |

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|                                                                                   |                                   |                |
|-----------------------------------------------------------------------------------|-----------------------------------|----------------|
|  | <b>PESO UNITARIO - PARAFINADO</b> |                |
|                                                                                   | Código: FR-IN-28                  | Versión: 1     |
| Controlado: SI (X) NO ( )                                                         | Vigencia: 14/06/2016              | Página: 1 de 1 |

PROYECTO: 300-18 HOSPITAL CEMOSA  
 CLIENTE: CEMOSA  
 LOCALIZACIÓN: HOSPITAL SUBA

FECHA DE ENTREGA DE RESULTADOS: 11/02/2017

|                                                  |         |             |             |         |         |             |         |
|--------------------------------------------------|---------|-------------|-------------|---------|---------|-------------|---------|
| Sondeo No.                                       | SM-01   | SM-02       | SM-02       | SM-02   | SM-02   | SM-02       | SM-02   |
| Muestra No.                                      | 10      | 1           | 3           | 5       | 7       | 9           | 11      |
| Profundidad (m)                                  | 6.4 - 7 | 1 - 1.5     | 2 - 2.5     | 3 - 3.5 | 4 - 4.5 | 5.5 - 6     | 7.4 - 8 |
| Peso de la muestra inicial (g)                   | 0.00    | 71.35       | 59.19       | 0.00    | 0.00    | 57.98       | 0.00    |
| Peso muestra parafinada en el aire + soporte (g) | 0.00    | 193.48      | 180.48      | 0.00    | 0.00    | 179.77      | 0.00    |
| Peso muestra parafinada sumergida + soporte (g)  | 0.00    | 138.37      | 133.34      | 0.00    | 0.00    | 135.04      | 0.00    |
| Peso del soporte (g)                             | 0.00    | 120.30      | 120.30      | 0.00    | 0.00    | 120.30      | 0.00    |
| Peso muestra parafinada sumergida (g)            | 0.00    | 18.07       | 13.04       | 0.00    | 0.00    | 14.74       | 0.00    |
| <b>Peso unitario total (g/cm3)</b>               |         | <b>1.34</b> | <b>1.29</b> |         |         | <b>1.35</b> |         |

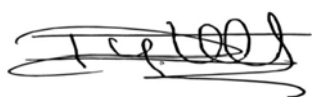
|                                                  |         |             |             |           |           |           |  |
|--------------------------------------------------|---------|-------------|-------------|-----------|-----------|-----------|--|
| Sondeo No.                                       | SM-02   | SM-1        | SM-1        | SM-1      | SM-1      | SM-1      |  |
| Muestra No.                                      | 12      | 1           | 3           | 5         | 7         | 8         |  |
| Profundidad (m)                                  | 8.4 - 9 | 0.3 - 0.9   | 1.5 - 2.1   | 2.7 - 3.3 | 3.5 - 4.5 | 4.5 - 5.1 |  |
| Peso de la muestra inicial (g)                   | 0.00    | 43.76       | 86.69       | 0.00      | 0.00      | 0.00      |  |
| Peso muestra parafinada en el aire + soporte (g) | 0.00    | 165.16      | 211.97      | 0.00      | 0.00      | 0.00      |  |
| Peso muestra parafinada sumergida + soporte (g)  | 0.00    | 131.40      | 146.52      | 0.00      | 0.00      | 0.00      |  |
| Peso del soporte (g)                             | 0.00    | 120.30      | 120.30      | 0.00      | 0.00      | 0.00      |  |
| Peso muestra parafinada sumergida (g)            | 0.00    | 11.10       | 26.22       | 0.00      | 0.00      | 0.00      |  |
| <b>Peso unitario total (g/cm3)</b>               |         | <b>1.34</b> | <b>1.45</b> |           |           |           |  |

|                                                  |  |  |  |  |  |  |  |
|--------------------------------------------------|--|--|--|--|--|--|--|
| Sondeo No.                                       |  |  |  |  |  |  |  |
| Muestra No.                                      |  |  |  |  |  |  |  |
| Profundidad (m)                                  |  |  |  |  |  |  |  |
| Peso de la muestra inicial (g)                   |  |  |  |  |  |  |  |
| Peso muestra parafinada en el aire + soporte (g) |  |  |  |  |  |  |  |
| Peso muestra parafinada sumergida + soporte (g)  |  |  |  |  |  |  |  |
| Peso del soporte (g)                             |  |  |  |  |  |  |  |
| Peso muestra parafinada sumergida (g)            |  |  |  |  |  |  |  |
| <b>Peso unitario total (g/cm3)</b>               |  |  |  |  |  |  |  |

|                                                  |  |  |  |  |  |  |  |
|--------------------------------------------------|--|--|--|--|--|--|--|
| Sondeo No.                                       |  |  |  |  |  |  |  |
| Muestra No.                                      |  |  |  |  |  |  |  |
| Profundidad (m)                                  |  |  |  |  |  |  |  |
| Peso de la muestra inicial (g)                   |  |  |  |  |  |  |  |
| Peso muestra parafinada en el aire + soporte (g) |  |  |  |  |  |  |  |
| Peso muestra parafinada sumergida + soporte (g)  |  |  |  |  |  |  |  |
| Peso del soporte (g)                             |  |  |  |  |  |  |  |
| Peso muestra parafinada sumergida (g)            |  |  |  |  |  |  |  |
| <b>Peso unitario total (g/cm3)</b>               |  |  |  |  |  |  |  |

Laboratorista JOSE PABUENA

Revisado y Aprobado:



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