

TABLERO GENERAL DE BAJA TENSIÓN

| TABLERO GENERAL DE BAJA TENSIÓN - TGBT | | | | | | | | | | | |
|--|--------|--------|-----------------|----------------------|--------|---|---------|---------------|------------------|--|-------------------|
| BALANCE DE FASES | | | VA INSTALADO | VA DEMANDA MAXIMA | I MAX | I para el calculo del conductor NTC 2050 | CALIBRE | CONDUCTORES | DUCTERIA | PROTECCIÓN | DESCRIPCIÓN |
| R | S | T | | | [A] | | FASE | Cu LSZH | | [A] | |
| 4157.5 | 3060.7 | 3414.4 | 10632.6 | 10632.6 | 29.51 | 36.89 | 8.00 | 3#8F+1#8N+10T | 1x1" pvc T/P | 3X40A | Acometida a TDC |
| 2879.5 | 2576.3 | | 5455.8 | 5455.8 | 26.23 | 32.79 | 6.00 | 2#6F+10T | 1x1 1/2" pvc T/P | 2X40A | Acometida a TDAL |
| 5835.8 | 5968.4 | 4942.1 | 16746.3 | 16746.3 | 46.48 | 58.10 | 4.00 | 3#4F+1#4N+10T | 1x1" pvc T/P | 3X50A | Acometida a TD1 |
| 7184.2 | 4913.7 | 4967.4 | 14545.3 | 17065.3 | 47.37 | 59.21 | 4.00 | 3#2F+1#2N+10T | 1x1 1/2" pvc T/P | 3X50A | Acometida a TD2 |
| | 4000.0 | 4000.0 | 8000.0 | 8000.0 | 38.46 | 48.08 | 4.00 | 2#4F+10T | 1x1 1/2" pvc T/P | 2X50A | Acometida a UPS |
| | | 2536.8 | 2536.8 | 2536.8 | 21.14 | 26.43 | 8.00 | 1#8F+1#8N+10T | 1x1" pvc T/P | 1X30A | Acometida a TR1 |
| | | 3157.9 | 3157.9 | 3157.9 | 26.32 | 32.89 | 4.00 | 1#4F+1#4N+10T | 1x1" pvc T/P | 1X30A | Acometida a TR2 |
| 760.6 | 760.6 | 760.6 | 2281.9 | 2281.9 | 6.334 | 7.917 | 8.00 | 3#8F+1#8N+10T | 1" P/Vc T/P | 3X30 A, 10 kA | Acometida a TBC |
| 650.1 | 650.1 | 650.1 | 1950.3 | 1950.3 | 5.414 | 6.767 | 8.00 | 3#8F+1#8N+10T | 1" P/Vc T/P | 3X20 A, 10 kA | Acometida a TBcAP |
| 3250.5 | 3250.5 | 3250.5 | 9751.6 | 9751.6 | 27.068 | 33.835 | 4.00 | 3#4F+1#4N+10T | 1x 1 1/2" P/Vc | Prot. Mag. 70A - Cte de rotor bloq. (NTC 2050) | Acometida TBcI |

CÁLCULO DE REGULACIÓN PARA BAJA TENSIÓN

| PROYECTO: | | | | | COLEGIO LA LEONA | | | | | | | | | | Estrato | | RURAL | | Fecha: | | | | NOVIEMBRE DE 2018 | | | REV | | 1.000 | | | | | | | | | |
|------------|------------|----------|-------|-------|----------------------------|--------------------|-------|------|--------------------------|------|-----|---------|---------------|----------|-------------------|-------|-------|-------|------------|-------|---|---------|-------------------|----------|-------------------------------|--------|------------------|--------|---------|--------------------------------|--|-------|----------------------|-------|--------------|---------------------|-------|
| LONGITUDES | | | | | CARACTERISTICA DE LA CARGA | | | | | | | | VALOR NOMINAL | | MOMENTO ELÉCTRICO | | | | | | REGULACION [%] | | | | CALIBRE, MEDIDOR Y PROTECCION | | | | TENSIÓN | Número de Conductores por fase | Número de Conductores de Puesta a Tierra | Ducto | Pérdidas de potencia | | | Pérdidas de Energía | |
| TRAMO | | LONG.(m) | | | P DMAX ALIMENTADOR | S DMAX ALIMENTADOR | FASES | FP | TIPO | MAT. | FS | CTE | CTE MAX | MOMENTO | KG | K | Fc | PERM. | REG. Total | | PROT. | CALIBRE | | R [Ω/km] | Pp [kW] | Pp [%] | Pw [%] | | | | | | | | | | |
| Inicio | Fin | V | H | Total | [W] | [KVA] | | | | | | [A] | 1,25"IN | [KVA'm] | | | | | | PARC | TOT | [A] | FASE | | | | | TIERRA | | | | | | | | | |
| SE | TGBT | 8.0 | 50.0 | 58.0 | 42750.000 | 45.00 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 124.908 | 156.134 | 2610.000 | 31.244 | 0.001 | 1.000 | 3.000 | 1.885 | 1.885 | 3X150A | 2/0 | 4 | | | | | 208 | | | | | 1.000 | 1.000 | 1x3" pvc T/P | 0.328 | 0.890 |
| TGBT | TDC | 5.0 | 8.0 | 13.0 | 10101.000 | 10.63 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 29.513 | 36.892 | 138.224 | 227.585 | 0.005 | 1.000 | 3.000 | 0.727 | 2.612 | 3X40A | 8 | 10 | 208 | 1.000 | 1.000 | 1x1" pvc T/P | 2.560 | 0.087 | 0.861 | 0.383 | | | | | | |
| TGBT | TDAL | 40.0 | 5.0 | 45.0 | 5183.000 | 5.46 | 2.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 26.230 | 32.787 | 245.511 | 144.602 | 0.003 | 2.000 | 3.000 | 1.641 | 3.526 | 2X40A | 6 | 10 | 208 | 1.000 | 1.000 | 1x1 1/2" pvc T/P | 1.610 | 0.150 | 2.885 | 1.285 | | | | | | |
| TGBT | TD1 | 38.0 | 6.0 | 44.0 | 15909.000 | 16.75 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 46.483 | 58.104 | 736.838 | 92.403 | 0.002 | 1.000 | 3.000 | 1.574 | 3.459 | 3X50A | 4 | 10 | 208 | 1.000 | 1.000 | 1x1 1/2" pvc T/P | 1.020 | 0.291 | 1.829 | 0.814 | | | | | | |
| TGBT | TD2 | 70.0 | 4.0 | 74.0 | 16212.000 | 17.07 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 47.368 | 59.211 | 1262.829 | 92.403 | 0.002 | 1.000 | 3.000 | 2.697 | 4.582 | 3X50A | 4 | 10 | 208 | 1.000 | 1.000 | 1x1 1/2" pvc T/P | 1.020 | 0.508 | 3.134 | 1.396 | | | | | | |
| TGBT | UPS | 2.0 | 3.0 | 5.0 | 7600.000 | 8.00 | 2.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 38.462 | 48.077 | 40.000 | 92.403 | 0.002 | 2.250 | 3.000 | 0.192 | 2.077 | 2X50A | 4 | 10 | 208 | 1.000 | 1.000 | 1x1 1/2" pvc T/P | 1.020 | 0.023 | 0.298 | 0.133 | | | | | | |
| UPS | TR1 | 3.5 | 38.4 | 41.9 | 2410.000 | 2.54 | 1.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 21.140 | 26.425 | 106.294 | 144.602 | 0.003 | 6.000 | 3.000 | 2.1 | 4.2 | 1X30A | 6 | 10 | 208 | 1.000 | 1.000 | 1x1" pvc T/P | 1.610 | 0.090 | 3.753 | 1.671 | | | | | | |
| UPS | TR2 | 4.0 | 67.0 | 71.0 | 3000.000 | 3.16 | 1.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 26.316 | 32.895 | 224.211 | 92.403 | 0.002 | 6.000 | 3.000 | 2.873 | 4.950 | 1X30A | 4 | 10 | 208 | 1.000 | 1.000 | 1x1" pvc T/P | 1.020 | 0.150 | 5.015 | 2.234 | | | | | | |
| TGBT | TBC | 4.0 | 85.0 | 89.0 | 2167.788 | 2.28 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 6.334 | 7.917 | 203.088 | 227.585 | 0.005 | 1.000 | 3.000 | 1.068 | 2.953 | 3x30A | 8 | 10 | 208 | 1.000 | 1.000 | 1" PVC T/P | 2.560 | 0.027 | 1.265 | 0.563 | | | | | | |
| TGBT | TBCAP | 4.0 | 90.0 | 94.0 | 1852.810 | 1.95 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 5.414 | 6.767 | 183.331 | 227.585 | 0.005 | 1.000 | 3.000 | 0.964 | 3.576 | 3x20A | 8 | 10 | 208 | 1.000 | 1.000 | 1" PVC T/P | 2.560 | 0.021 | 1.142 | 0.509 | | | | | | |
| SE | TBCI | 8.0 | 160.0 | 168.0 | 9264.052 | 9.75 | 3.000 | 0.95 | Acometidas [Red abierta] | Cu | 1.0 | 27.068 | 33.835 | 1638.275 | 92.403 | 0.002 | 1.000 | 3.000 | 3.499 | 3.499 | Prot. Mag. 70A - Cte de rotor bloq (NTC 2050) | 4 | 10 | 208 | 1.000 | 1.000 | 1x 1 1/2" PVC | 1.020 | 0.377 | 4.066 | 1.811 | | | | | | |
| PLANTA | TRANSF BCI | 8.0 | 90.0 | 98.0 | 20000.000 | 23.53 | 3.000 | 0.85 | Acometidas [Red abierta] | Cu | 1.0 | 65.311 | 81.639 | 2305.882 | 55.932 | 0.001 | 1.000 | 3.000 | 2.981 | 2.981 | 3X80A | 2 | 8 | 208 | 1.000 | 1.000 | 2" PVC | 0.623 | 0.781 | 3.906 | 1.740 | | | | | | |




CÁLCULO DE ACOMETIDA– BOMBAS

| TBC TABLERO TRIFÁSICO BOMBA DE CONSUMO | | | | | | | | | | |
|--|------------------|-------------|-------------|--------|--------------|--|------------------------|------------|---------------|----------------------------|
| Nº | BALANCE DE FASES | | | VA | I MAX [A] | I para el calculo del conductor NTC 2050 | CONDUCTORES Cu LSZH | DUCTERIA | PROTECCIÓN | DESCRIPCIÓN |
| Circuito | R | S | T | | | | | | [A] | |
| | | | | | | | | | | |
| 1-3-5 | 760.627451 | 760.627451 | 760.627451 | 2281.9 | 19.02 | 23.77 | 3#8F+1#8N+1#10T | 1" PVC T/P | 3X30 A, 10 kA | Bombas de consumo |
| 2-4-6 | 650.1089325 | 650.1089325 | 650.1089325 | 1950.3 | 16.25 | 20.32 | 3#8F+1#8N+1#10T | 1" PVC T/P | 3X20 A, 10 kA | Bomba de captación de agua |
| | | | | | | | | | | |
| Nº de salidas | 1410.736383 | 1410.736383 | 1410.736383 | 4232.2 | 20.35 | 25.43 | 3#8F+1#8N +1#10T | 1" PVC T/P | 3x30A, 25 kA | Acometida a TGD |

CÁLCULO CARGAS TABLERO REGULADO TR1

| TR1 Tablero Monofásico 8 CTOS | | | | | | | | | | | | | |
|-------------------------------|----------|-----------------|---------------|---------------|-----|-----------|-----------|--|-----------------------|---------------|---------------|---|-----------------|
| Nº | | | | BALANCE FASES | | VA | I MAX | I para el calculo del conductor NTC 2050 | CONDUCTORES | DUCTERIA | PROTECCIÓN | DESCRIPCIÓN | |
| Circuito | Regulado | Salida en techo | Panel 60x60cm | S | | [A] | | | Cu LSZH | | [A] | | |
| | 180 | 180 | 40 | | | | | | | | | | |
| TR1.1 | 5 | 900 | 0 | 0 | 900 | 947.36842 | 7.89 | 9.87 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomas Aulas Bilinguismo y Polivalentes. | |
| TR1.2 | 4 | 720 | 0 | 0 | 720 | 757.89474 | 6.32 | 7.89 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomas Administración Parte 1 | |
| TR1.3 | 3 | 540 | 0 | 0 | 540 | 568.42105 | 4.74 | 5.92 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomas Administración Parte 2 | |
| TR1.4 | 1 | 250 | 0 | 0 | 250 | 263.15789 | 2.19 | 2.74 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Rack | |
| TR1.5 | 5 | 900 | 0 | 0 | 900 | 947.36842 | 7.89 | 9.87 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomacorriente en sala TIM | |
| TR1.6 | 5 | 900 | 0 | 0 | 900 | 947.36842 | 7.89 | 9.87 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomacorriente en sala TIM | |
| TR1.7 | 4 | 720 | 0 | 0 | 720 | 757.89474 | 6.32 | 7.89 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomacorriente en sala TIM | |
| TR1.8 | 4 | 720 | 0 | 0 | 720 | 757.89474 | 6.32 | 7.89 | 2xNº12(F+N) + 1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomacorriente en sala TIM | |
| Nº de salidas | 13 | 2410 | 0 | 0 | 0 | 2410 | 2536.8421 | 21.14 | 26.43 | 1#8F+1#8N+10T | 1x1" pvc T/P | 1X30A | Acometida a TR1 |

CÁLCULO DE CARGAS TABLERO REGULADO TR2

| TR2 Tablero Monofásico 4 CTOS | | | | | | | | | | | | |
|-------------------------------|---|---|---|---------------|------|-----------|--|-------------|---------------------|--------------|---------------|---|
| Nº |  |  |  | BALANCE FASES | VA | I MAX | I para el calculo del conductor NTC 2050 | CONDUCTORES | DUCTERIA | PROTECCIÓN | DESCRIPCIÓN | |
| Circuito | Regulado | Salida en techo | Panel 60x60cm | R | | [A] | | Cu LSZH | | [A] | | |
| | 180 | 180 | 40 | | | | | | | | | |
| TR2.1 | 6 | 1080 | 0 | 0 | 1080 | 1136.8421 | 9.47 | 11.84 | 2xNº12(F+N)+1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomas aulas primero a tercer grado, preescolar y portería |
| TR2.2 | 5 | 900 | 0 | 0 | 900 | 947.36842 | 7.89 | 9.87 | 2xNº12(F+N)+1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomas aulas de cuarto a séptimo |
| TR2.3 | 4 | 720 | 0 | 0 | 720 | 757.89474 | 6.32 | 7.89 | 2xNº12(F+N)+1xNº12T | 3/4" EMT | 1x20 A, 10 kA | Tomas aulas octavo a once |
| TR2.4 | 1 | 300 | 0 | 0 | 300 | 315.78947 | 2.63 | 3.29 | 2xNº12(F+N)+1xNº12T | 3/4" EMT | 1x20 A, 10 kA | toma de panel de incendios |
| Nº de salidas | 16 | 3000 | 0 | 0 | 3000 | 3157.8947 | 26.32 | 32.89 | 1#4F+1#4N+10T | 1x1" pvc T/P | 1X30A | Acometida a TR2 |

CÁLCULO– LLENADO DE DUCTERÍA

| CALCULO DE DUCTERIA | | | | | | | | | | | | % MAX | | | | | | | | | | | | | | |
|---------------------|-------|----------|-------------|---|---|---|---|-----|---|---|---|---------------------|-------|---|---------------------|---|---|----|---|---|---------|---|---|--------|---------|--------|
| | | | | | | | | | | | | 40 | | | | | | | | | | | | | | |
| TRAMO | | MATERIAL | CONDUCTORES | | | | | | | | | SECCIÓN TOTAL (mm2) | DUCTO | | % OCUPACIÓN X DUCTO | | | | | | | | | | | |
| INICIO | FIN | | | | | | | | | | | | | | | | | | | | | | | | | |
| SE | TGBT | Cu-LSZH | 1 | x | (| 3 | # | 2/0 | F | + | 1 | # | 2/0 | N | + | 1 | # | 4 | T |) | 740.216 | 1 | x | 3" | 5375.72 | 13.770 |
| TGBT | TDC | Cu-LSZH | 1 | x | (| 3 | # | 8 | F | + | 1 | # | 8 | N | + | 1 | # | 10 | T |) | 133.087 | 1 | x | 1" | 695.22 | 19.143 |
| TGBT | TDAL | Cu-LSZH | 1 | x | (| 2 | # | 6 | F | + | 1 | # | 6 | N | + | 1 | # | 10 | T |) | 161.753 | 1 | x | 1 1/2" | 1478.53 | 10.940 |
| TGBT | TD1 | Cu-LSZH | 1 | x | (| 3 | # | 4 | F | + | 1 | # | 4 | N | + | 1 | # | 10 | T |) | 276.344 | 1 | x | 1 1/2" | 1478.53 | 18.690 |
| TGBT | TD2 | Cu-LSZH | 1 | x | (| 3 | # | 4 | F | + | 1 | # | 4 | N | + | 1 | # | 10 | T |) | 276.344 | 1 | x | 1 1/2" | 1478.53 | 18.690 |
| TGBT | UPS | Cu-LSZH | 1 | x | (| 2 | # | 4 | F | + | 1 | # | 4 | N | + | 1 | # | 10 | T |) | 211.305 | 1 | x | 1 1/2" | 1478.53 | 14.292 |
| UPS | TR1 | Cu-LSZH | 1 | x | (| 1 | # | 6 | F | + | 1 | # | 6 | N | + | 1 | # | 10 | T |) | 113.231 | 1 | x | 1" | 695.22 | 16.287 |
| UPS | TR2 | Cu-LSZH | 1 | x | (| 1 | # | 4 | F | + | 1 | # | 4 | N | + | 1 | # | 10 | T |) | 146.266 | 1 | x | 1" | 695.22 | 21.039 |
| TGBT | TBC | Cu-LSZH | 1 | x | (| 3 | # | 8 | F | + | 1 | # | 8 | N | + | 1 | # | 10 | T |) | 133.087 | 1 | x | 1" | 695.22 | 19.143 |
| TGBT | TBCAP | Cu-LSZH | 1 | x | (| 3 | # | 8 | F | + | 1 | # | 8 | N | + | 1 | # | 10 | T |) | 133.087 | 1 | x | 1" | 695.22 | 19.143 |
| SE | TBCI | Cu-LSZH | 1 | x | (| 3 | # | 4 | F | + | 1 | # | 4 | N | + | 1 | # | 10 | T |) | 276.344 | 1 | x | 2" | 2309.26 | 11.967 |