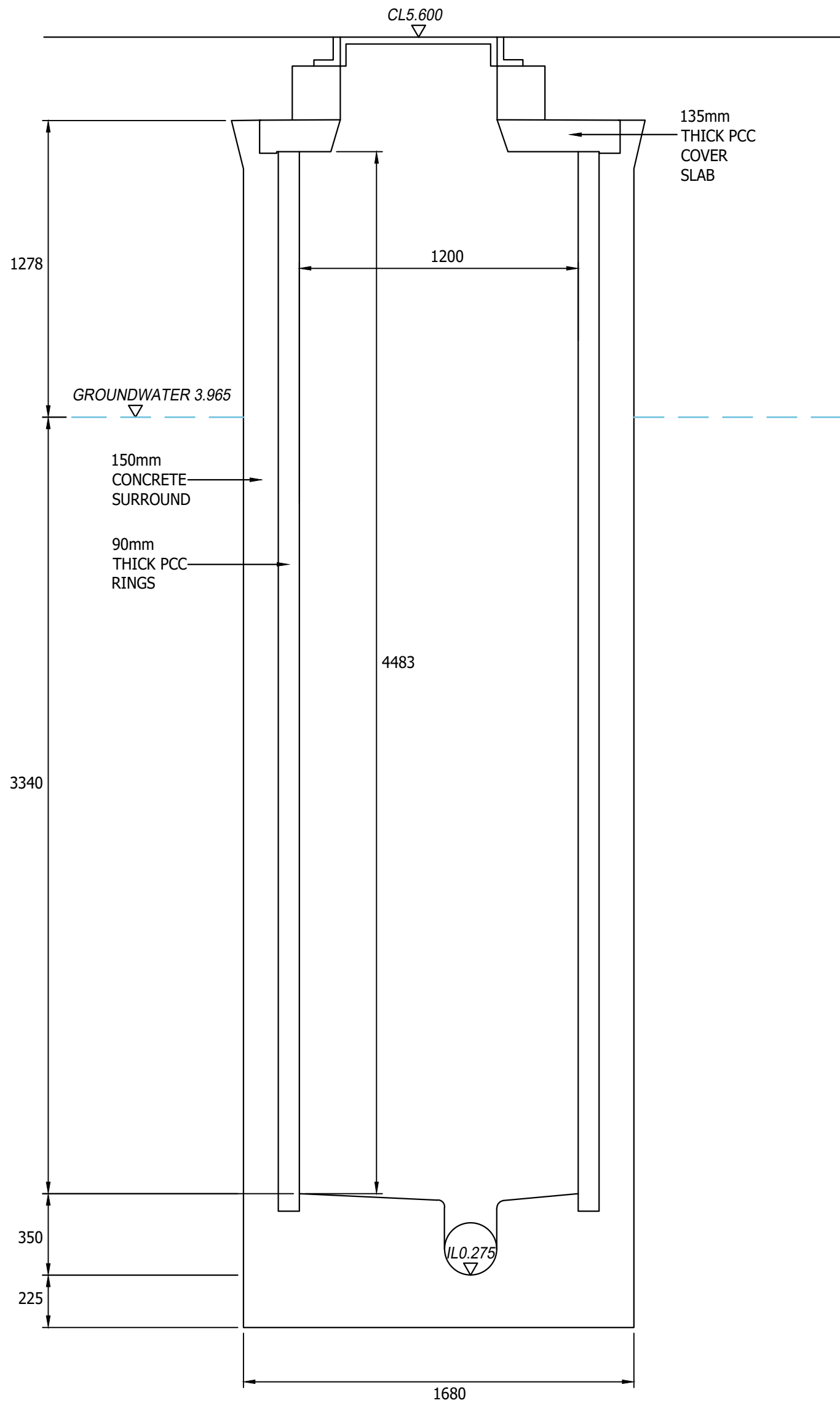




FWMH39 MANHOLE

FLOTATION CALCULATIONS

WATER DISPLACED BY CHAMBER:

1.2m I/DIA., VOLUME = $\pi r^2 \times d$
= $\pi \times 0.840^2 \times 3.915$
= 8.678m³

MASS = $\rho_w \times V$ = 1000 kg/m³ x 8.678
= 8678 kg
x g (9.8 m/s²) = 85044.4 N
= 85.044 kN

FACTOR OF SAFETY = 1.2

i.e 85.044 x 1.2 = **102.053 kN** (BUOYANCY FORCE)

CHAMBER SELF-WEIGHT:

COVER SLAB = 390 kg
x g (9.8 m/s²) = 3822 N
= **3.822 kN**

RINGS (excl. base) = 4.483m DEEP
RINGS (area) = $\pi r_{(o)}^2 - \pi r_{(i)}^2$
= $(\pi \times 0.69^2) - (\pi \times 0.60^2)$
= 1.495 - 1.131
= 0.364m²

RINGS (volume) = 0.364 x 4.483 = 1.632m³
MASS = 1.632m³ x 2140 kg/m³
= 3492 kg
x g (9.8 m/s²) = 34222 N
= **34.222 kN**

SURROUND (excl. base) = 4.617m DEEP
SURROUND (area) = $\pi r_{(o)}^2 - \pi r_{(i)}^2$
= $(\pi \times 0.84^2) - (\pi \times 0.69^2)$
= 2.216 - 1.495
= 0.721m²

RINGS (volume) = 0.721 x 4.617 = 3.329m³
MASS = 3.329m³ x 2500 kg/m³
= 8322.1 kg
x g (9.8 m/s²) = 81557 N
= **81.557 kN**

CONCRETE BASE = 0.575m DEEP
BASE (volume) = $\pi r^2 \times d$
= $(\pi \times 0.84^2) \times 0.575$
= 1.274m³
MASS = 1.274m³ x 2500 kg/m³
= 3186.5 kg
x g (9.8 m/s²) = 31227.9 N
= **31.227 kN**

i.e. CHAMBER SELF-WEIGHT TOTAL
= 3.822 + 34.222 + 81.557 + 31.227
= **150.828 kN**

150.828 > 102.053 kN ∴ OK (NO FLOTATION)

- Notes
1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gta prior to works commencing.
 2. Prior to commencement of works the contractor shall provide co-ordinated and dimensioned installation drawings and calculations and allow 10 working days for gta`s checking procedure prior to proceeding with those works or the ordering of materials.
 3. Tender or billing drawings shall not be used for construction or the ordering of materials.
 4. Do not scale. All dimensions and levels to be site confirmed.
 5. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements
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