

GENERAL 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.

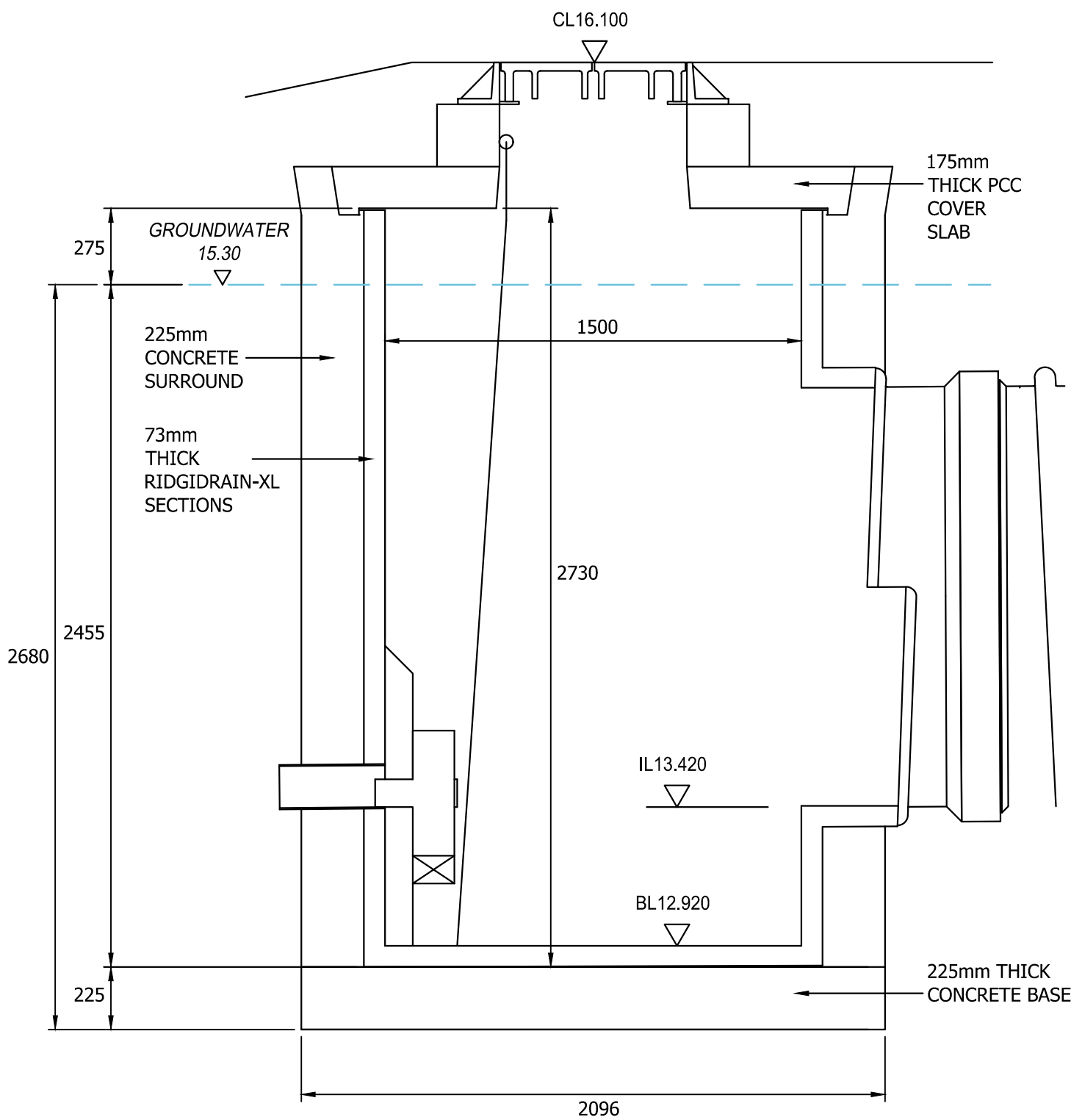
2. Tender or billing drawings shall not be used for construction or the ordering of materials.

3. Do not scale. All dimensions and levels to be site confirmed.

4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements

5. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.



Downstream Chamber (Control)

FLOTATION CALCULATIONS

WATER DISPLACED BY CHAMBER:

1.946m O/DIA., VOLUME = $\pi r^2 \times d$
= $\pi \times 0.973^2 \times 2.680$
= 7.971m³

MASS = pw x V = 1000 kg/m³ x 7.971 = 7971 kg
x g (9.8 m/s²) = 78115.8 N
FACTOR OF SAFETY = 1.2

i.e 94.176 x 1.2 = **93.739 kN** (BUOYANCY FORCE)

CHAMBER SELF-WEIGHT:

COVER SLAB = 1060 kg
x g (9.8 m/s²) = 10388 N
= **10.388 kN**

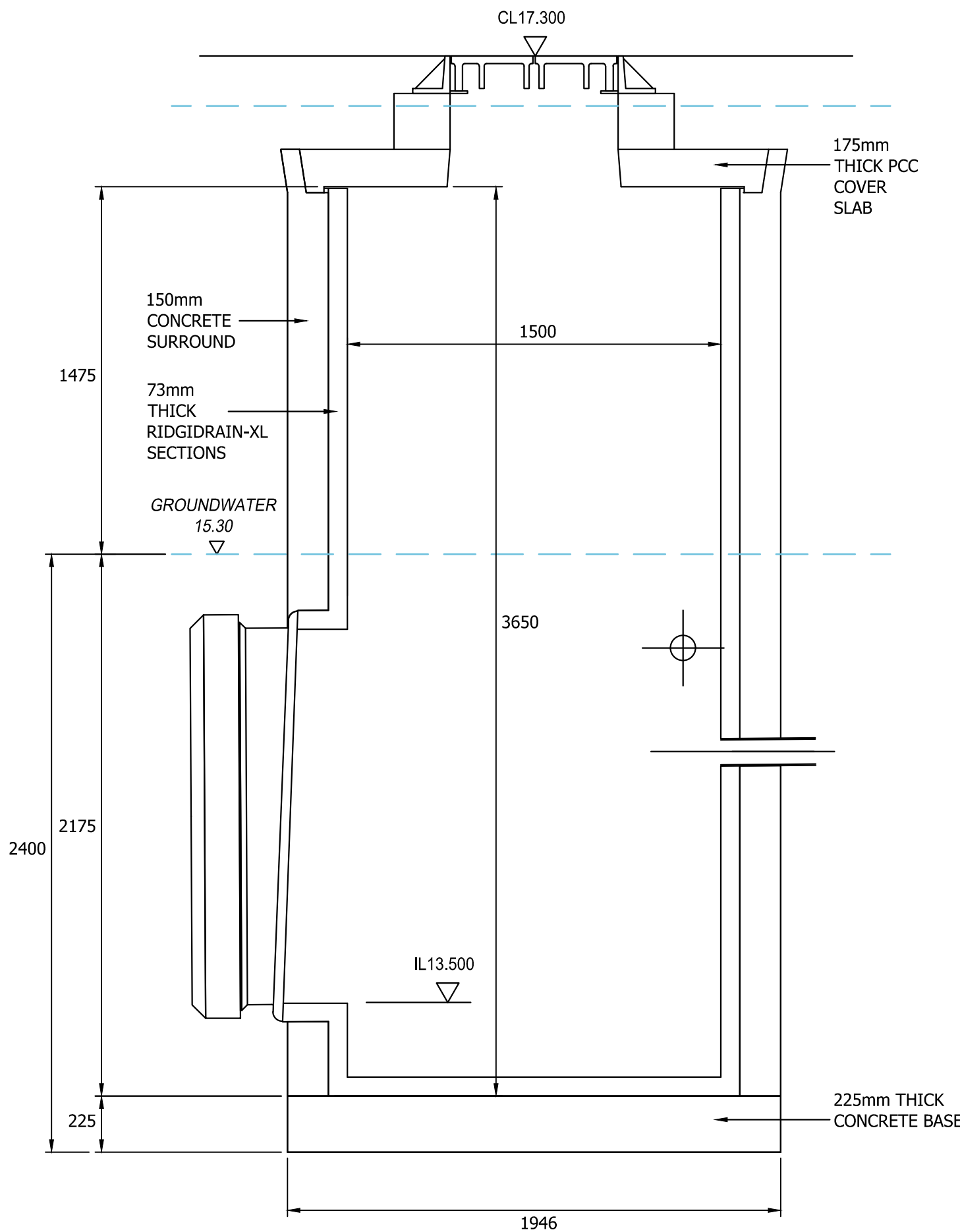
TANK UNITS = 2.730 x 77 kg/M = 210.21 kg
x g (9.8 m/s²) = 2060.058 N
= **2.060 kN**

SURROUND (excl. base) = 2.730m DEEP
SURROUND (area) = $\pi r^2_{\text{out}} - \pi r^2_{\text{in}}$
= $(\pi \times 1.048^2) - (\pi \times 0.823^2)$
= 3.45 - 2.128
= 1.322m²
SURROUND (volume) = 1.322 x 2.730 = 3.609m³
MASS = 3.609m³ x 2500 kg/m³ = 9022.65 kg
x g (9.8 m/s²) = 88421.97 N
= **88.422 kN**

CONCRETE BASE = 0.225m DEEP
BASE (volume) = $\pi r^2 \times d$
= $(\pi \times 1.048^2) \times 0.225$
= 0.776m³
MASS = 0.776m³ x 2500 kg/m³ = 1940.86 kg
x g (9.8 m/s²) = 19020.46 N
= **19.02 kN**

i.e. CHAMBER SELF-WEIGHT TOTAL
= 10.388 + 2.060 + 88.422 + 19.02
= **119.89 kN**

119.89 > 93.739 kN ∴ OK (NO FLOTATION)



Upstream Chamber (Inlet)

FLOTATION CALCULATIONS

WATER DISPLACED BY CHAMBER:

1.946m O/DIA., VOLUME = $\pi r^2 \times d$
= $\pi \times 0.973^2 \times 2.400$
= 7.138m³

MASS = pw x V = 1000 kg/m³ x 7.138 = 7138.168 kg
x g (9.8 m/s²) = 69954.05 N
FACTOR OF SAFETY = 1.2

i.e 69.954 x 1.2 = **83.9448 kN** (BUOYANCY FORCE)

CHAMBER SELF-WEIGHT:

COVER SLAB = 1060 kg
x g (9.8 m/s²) = 10388 N
= **10.388 kN**

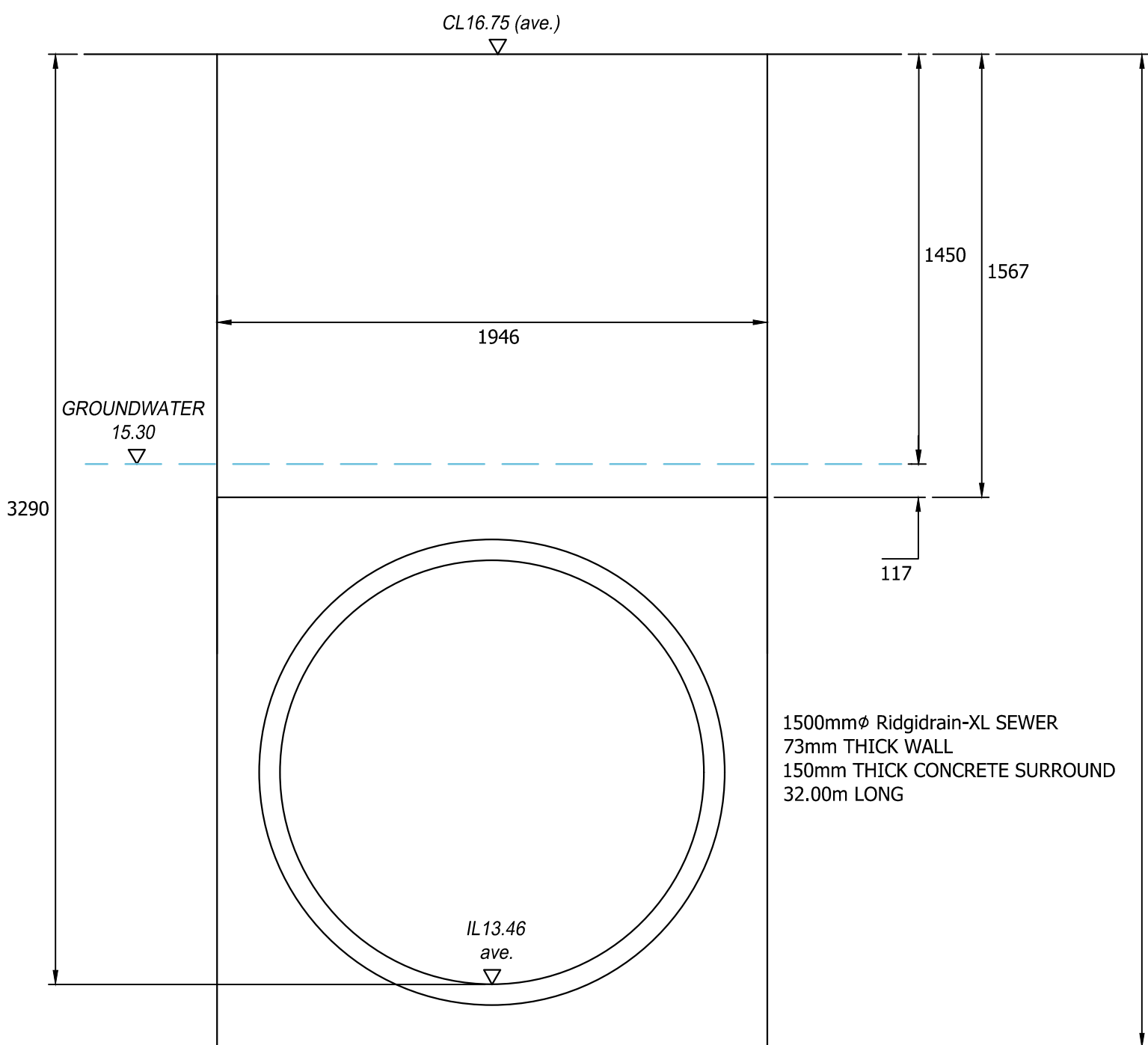
TANK UNITS = 3.65 x 77 kg/M = 281.05 kg
x g (9.8 m/s²) = 2754.29 N
= **2.754 kN**

SURROUND (excl. base) = 3.65m DEEP
SURROUND (area) = $\pi r^2_{\text{out}} - \pi r^2_{\text{in}}$
= $(\pi \times 0.973^2) - (\pi \times 0.823^2)$
= 2.974 - 2.128
= 0.846m²
SURROUND (volume) = 0.846 x 3.65 = 3.0879m³
MASS = 3.0879m³ x 2500 kg/m³ = 7719.75 kg
x g (9.8 m/s²) = 75653.55 N
= **75.653 kN**

CONCRETE BASE = 0.225m DEEP
BASE (volume) = $\pi r^2 \times d$
= $(\pi \times 0.973^2) \times 0.225$
= 0.669m³
MASS = 0.669m³ x 2500 kg/m³ = 1673 kg
x g (9.8 m/s²) = 16395.48 N
= **16.395 kN**

i.e. CHAMBER SELF-WEIGHT TOTAL
= 10.388 + 2.754 + 75.653 + 16.395
= **105.19 kN**

105.19 > 83.9448 kN ∴ OK (NO FLOTATION)



1500mmØ Ridgidrain-XL

FLOTATION CALCULATIONS

WATER DISPLACED BY TANK & SURROUND:

VOLUME = w x h x l
= 1.946 x 1.946 x 29.0
= 109.82m³

MASS = pw x V = 1000 kg/m³ x 109.82 = 109820.56 kg
x g (9.8 m/s²) = 1076241.527 N
FACTOR OF SAFETY = 1.2

i.e 1076.24 x 1.2 = **1291.49 kN** (BUOYANCY FORCE)

TANK SELF-WEIGHT:

TANK UNITS = 29.0 x 77 kg/M = 2233 kg
x g (9.8 m/s²) = 21883.4 N
= **21.8834 kN**

CONCRETE SURROUND

VOLUME = (w x h x l) - ($\pi r^2 \times l$)
= (1.946 x 1.946 x 29.0) - ($\pi \times 0.823^2 \times 29.0$)
= 109.82 - 61.709
= 48.111m³
DENSITY OF CONCRETE = 2500 kg/m³
i.e. 2500 x 48.111 = 120277.8 kg
x g (9.8 m/sec²) = 1178722.869 N
= **1178.72 kN**

UNSATURATED BACKFILL VOLUME = 52.596m² x 1.450m = 76.264m³
DENSITY OF UNSATURATED BACKFILL = 1020 kg/m³
i.e. 1020 x 76.264 = 77789.5 kg
x g (9.8 m/s²) = 762336.94 N
= **762.337 kN**

SATURATED BACKFILL VOLUME = 52.596m² x 0.117m = 6.1537m³
DENSITY OF SATURATED BACKFILL = 2000 kg/m³
i.e. 2000 x 6.1537 = 12307.464 kg
x g (9.8 m/s²) = 120613.147 N
= **120.613 kN**

i.e. STORAGE TANK SELF-WEIGHT TOTAL
= 221.8834 + 1178.72 + 762.337 + 120.613
= **2283.55 kN**

2283.55 > 1291.49 kN ∴ OK (NO FLOTATION)

P2	DRAINAGE ADJUSTED TO CONNECT TO EXISTING PIPED OUTFALL	08.03.21	DMS	MR
P1	INITIAL ISSUE	18.08.20	DMS	MR
Rev	Amendments	Date	Disn	Chk
Status				
PLANNING				
Client				
COMFORT INN				
Architect				
ATELIER CONSULTANTS				
Project				
ARUNDEL RESIDENCE INN CROSSBUSH, ARUNDEL				
Title				
STORAGE TANK FLOTATION CALCULATIONS				
Date		Scale @ A1		
AUGUST 2020		NTS		
Base Layout Ref.		CAD File ref.		
Clients Ref.		Project Ref.		
		7321		
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Drawing Number				Rev.
7321/103				P2