PRIMARY & SECONDARY CONTAINMENT REPORT WITH BUND CAPACITY CALCULATIONS

FOR

PROPOSED ANAEROBIC DIGESTION PLANT

AT

THREE MAIDS,

ON BEHALF OF

Project ref:	**GGP/29348/Three Maids/Bund Calcs**
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APPENDICES

Appropriately Qualified Person Statement:
This report has been prepared and written by Jeremy Collins BSc (Hons) MCIWEM, Civil Engineer. Who has Over 18 year's industry experience across reinforced concrete, water retaining structures, building & structures, SuDS & Highway design and detailing. In addition, Jeremy has designed and detailed over 30 Anaerobic Digestion plants been fully compliant to CIRIA C736 & EA (BAT) Guidance.

Document Revision Box			
Revision	Date	Description	Author
01	12th May 2023	First Issue	JHC
02	1st September 2023	Contract Issue	JHC
03	2nd February 2024	Construction Issue	KW
04	23rd February 2024	EA Permit Issue	KW

1.0 Brief

GGP Consult has been requested by Acorn Bioenergy Ltd Limited to prepare containment calculations for the proposed Anaerobic Digestion Plant for Three Maids.

The calculations demonstrate the philosophy behind the bunding of the site and how a tank failure event would be contained within the site boundary.

2.0 Description

The proposed bund will contain 5 digester tanks of similar sizes, and a few smaller "tank".

A drawing has been provided showing the proposed site layout with tank sizes indicated.

This can be seen in Appendix I.

3.0 Design Philosophy

The AD plant shall be bunded with a reinforced concrete wall, a full internal concrete slab and underlay with a GCL membrane on lime/cement impervious stabilised ground strata.

The report design approach will be determining the if the proposed designed wall height of 93.275m AOD will provide sufficient containment volume in line with thew requirements set out in CIRIA C736.

All tanks shall operate with a "high" alarm and max fill overflow pipes. Therefore, it is technically impossible for these tanks to be overfilled. These levels can therefore be adopted in accordance with *CIRA C736, Section 4.3.2. "However, where the tank is fitted with a physical overflow, the capacity at which the tank would overflow may be taken."*

Max fill capacity levels will be taken for all tank and not operational levels. This will be referred to as "fill level" within this report.

Further design points are the 10% margin has been interpreted by industry and regulators to cover a range of factors including,

- Prevention of overtopping of the bund in the event of a surge of liquid caused by catastrophic failure of the primary tank.
- Prevention of overtopping, which may be caused by wind-induced wave action during the time that the bund is full, following a failure of a primary tank.
- An allowance for firefighting agents, including a foam blanket on the surface or firefighting water.
- Protection against overfilling.
- An allowance for rain that might collect in the bund and reduce its net capacity, or for rain that might fall in coincident with, or immediately following, the failure of the primary containment.

Based on the above, providing the bund can contain the 110%, no further action is required to justify an increase wall height of any of the above points.

However, for the purpose of this report a quantitative assessment of these assumptions will be provided in section 9.0.

As part of the quantitative assessment, the 100% volume will always be taken and compared against.

Design Standards:

The bund capacity will be calculated in line with *CIRA C736, Section 4.2.1*

"Where two or more tanks are installed within the same bund, the recommended capacity of the bund is the greater of:"

1. 110% of the capacity of the largest tank within the bund.

2. 25% of the total capacity of all the tanks within the bund, except where tanks are hydraulically linked in which case they should be treated as if they were a single tank.

4.0 Bund Capacity

4.1 110% of the largest Tank Capacity

The largest proposed tank is one of the digester tanks at 32.4m Diameter (Internal) with a wall height of 8m. The tank will have an available fill height of 7.5m.

Tank Volume	**= 6,183.59m³**
110% Volume	**= 6,801.95m³**

4.2 25% of Total Tank Capacity

The tank capacities will have an available fill height of 0.5m less than the internal wall height.

For all tank capacities see appendix 1.

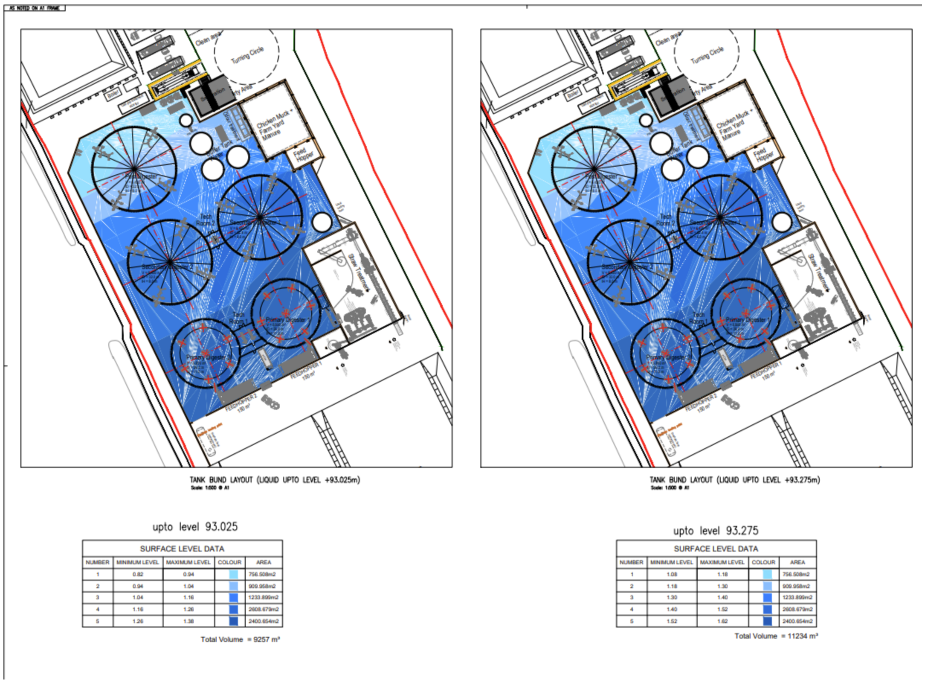
Primary Digester 1 - 2	= 5,574.76m³	x 2No.	= 11,149.52m³
Secondary 1 - 2	= 6,183.59m³	x 2No.	= 12,367.19m³
Post Digester	= 6,183.59m³	x 1No.	= 6,183.59m³
Pasteurisation Tank	= 50.00m³	x3No.	= 150.00 m³
Dirty Water Tank 1 - 3	= 400.00m³	x 3No.	= 1200.00 m³
Liquid Feed Tank 1 - 3	= 400.00m³	x 1No.	= 1200.00 m³
Total tank Volume			= 32,250.30m³

25% Volume = 8,062.57m³ > 110%

THEREFORE 25% CAPACITY WILL BE USED FOR THE BUND VOLUME

5.0 Available Bund Volume – Design Stage

A detail assessment of the bund proposed levels has been undertaken. A 2D/3D model has been generated to provide an accurate available volume within the bund. See appendix II.



SURFACE LEVEL DATA (upto level 93.025)

NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA
1	0.82	0.94		756.508m2
2	0.94	1.04		909.958m2
3	1.04	1.16		1233.899m2
4	1.16	1.26		2608.679m2
5	1.26	1.38		2400.654m2

Total Volume = 9257 m³

SURFACE LEVEL DATA (upto level 93.275)

NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA
1	1.08	1.18		756.508m2
2	1.18	1.30		909.958m2
3	1.30	1.40		1233.899m2
4	1.40	1.52		2608.679m2
5	1.52	1.62		2400.654m2

Total Volume = 11234 m³

The model has taken the proposed internal bund levels and included all tanks available to flood, based on the 25% worst case scenario up to designed retaining wall level with freeboard capacity at 93.275m AOD.

From the model an available liquid volume within the bund has been calculated to be 9,257m³ without the required 250mm freeboard.

From the model an available liquid volume within the bund has been calculated to be 11,234m³ with the required 250mm freeboard.

The proposed bund capacity requirements have confirmed that the 25% volumes shall be taken as concluded in section 4.0.

The final available liquid volume within the bund for the 25% scenario will be 9,257m³.

It has therefore been demonstrated that the available bund volume based on a top of wall height no less than 93.275m AOD provides more than sufficient volume to contain the 25% volume.

6.0 Quantitative Assessment for the 10% / 25% Arbitrary Allowance

In accordance with the *CIRA C736,* guidance, the following section shall review the 25% increase.

The 25% capacity based on max fill level equates to.

8,062,57m³

Based on the detailed assessment undertaken using a 2D model, an available volume equates to **9,257m³.**

Rainfall shall now be considered.

6.1 Rainfall Allowance

At the time of a failure, it can be assumed that the drainage system will be empty providing an allowance is made for rainfall equal to a 1:100 year return period 24hr duration before & 8 days' duration after a failure event (*CIRA C736, Section 4.3.3, page 43 & 44).*

For a first estimate fig 4.2 average rainfall depths (from HR Wallingford, 1986) shall be used.

Based on the below table (see following page), a total rainfall depth of 136mm (41mm + 95mm) should be accounted for.

41mm of rainfall occurred across the site dirty water area 24hr before a failure event, equating to

344.4m³ (8,400 x 0.041 = 344.4).

Based on the above the bund will have sufficient capacity to contain the first 41mm.

8,062.57m³ + 344.4m³ = 8,406.97m³ < 9,257m³ - **PASS**

Now to consider 8 days of rainfall be 95mm.

95mm of rainfall occurred across the site dirty water area 8 days after a failure event, equating to

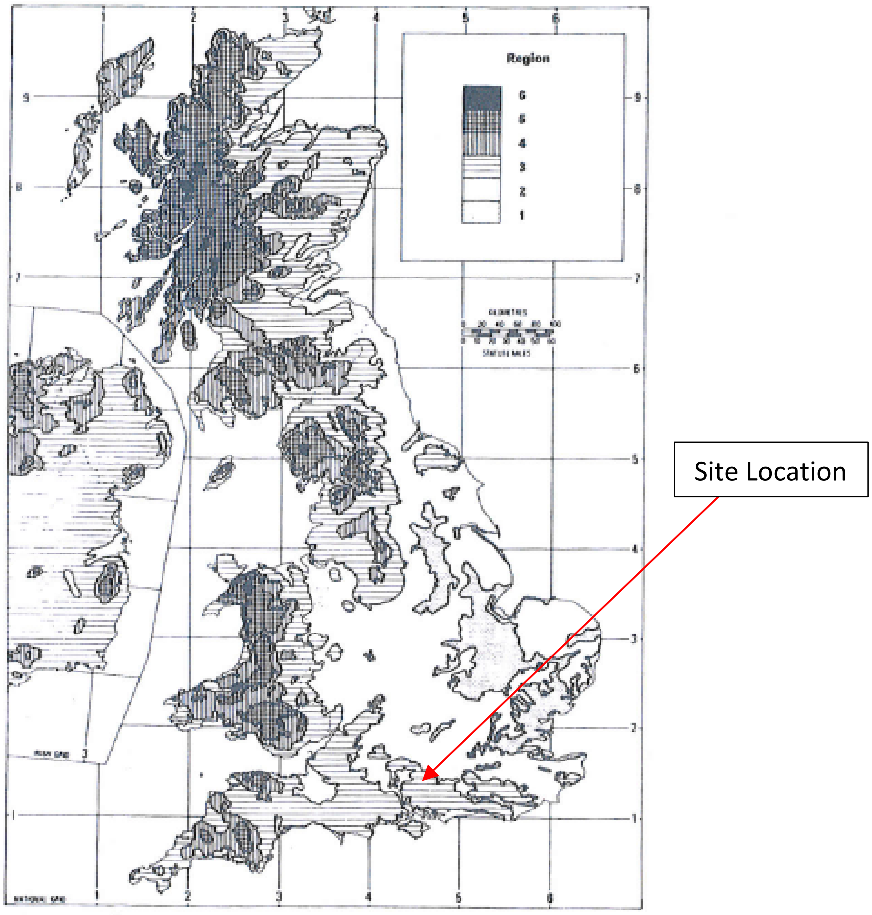
798.0m³ (8,400 x 0.095 = 798.0).

Based on the above the containment will have sufficient capacity to contain the first 41mm plus the additional 95mm.

8,062.57m³ + 344.4m³ + 798.0m³ = 9,204.97m³ < 9257m³ - **PASS**

It can now be concluded that the bund will have sufficient capacity to contain a failure event including rainfall.

Freeboard & dynamic effects shall now be considered.



Region	Standard annual average rainfall (mm)	Rainfall depth (mm) 10-year return period	
		24-hr duration	8-day duration
1	<600	29	54
2	600–800	32	65
3	800–1200	41	95
4	1200–1600	52	120
5	1600–3200	88	231
6	3200	106	288

Notes

It should be stressed that Figure 4.2 should only be used to derive a first estimate for considering containment volumes. This is for two reasons:

1. The figure is based on *Flood studies report* (Institute of Hydrology, 1975) data produced up to 1986.
2. Climate change effects since the publication of HR Wallingford (1986) will have resulted in different annual rainfall figures.

Detailed design should therefore be based on the output of the FEH rainfall.

Figure 4.2 ***Average rainfall depths (from HR Wallingford, 1986)***

Based on the above table at total rainfall depth of 136mm (95mm + 41mm) should be added to the bund wall height.

6.2 Freeboard & Dynamic Effects

An allowance for freeboard in bund and dynamic effects should be added to the final bund height required for the worse case failure i.e.25%.

Freeboard / Firefighting Foam

The tank contents are not of a flammable nature and therefore the allowance for firefighting foam is not considered necessary for this development.

Surge

CIRA C736, Section 4.4, page 53 & 54. fig 4.7.

Table 4.7 Surge allowance (in the absence of detailed analysis)

Type of structure (see Part 3)	Allowance
In situ reinforced concrete and blockwork bunds	250 mm
Secondary containment tanks	250 mm
Earthwork bunds	750 mm

Based on the above table at total surge allowance of 250mm should be added to the bund wall height.

As the lowest containment level is located within the reinforced concrete section 250mm will be considered.

Surge shall be considered at the time of failure.

The available bund volume at time of failure will be 11,234m³.

25% volume = 8,062.57m³.

25% volume + Rainfall = 9,204.97m³

11,234 LESS 9,204.97 = 2,029.03m³.

Wall available surge height = 2,029.03/ area (8,400) 7,939.5 = 0.255m

Therefore, based on the above and the proposed wall height of 93.275m AOD will comply with the surge allowance required set out in table 4.7 above.

7.0 Jetting Failure

The failure of a storage tank through a rupture or corrosion of the side wall, could result in the escape of a jet of liquid. This is referred to as jetting.

The risk of jetting cannot be designed out, however maintenance of the tank through internal inspections can assess the condition of the tank. However, this is not always practical or feasible.

Additional protection measures have been included by all tanks being covered in insulation & cladding. The cladding system will add a secondary protection measure to jetting failures, with the likely event forcing AD material to run down the internal face of the cladding panels.

This is considered as an acceptable protection measure.

8.0 Design Summary

- 25% of all tank volume has demonstrated to be the worst-case design option when compared against 110% of the largest tanks.

- Analysis of the proposed structural slab levels has demonstrated an available volume equal to 11,234m³ based on the proposed minimum wall level of 93.275m AOD

- Surge allowance of 250mm has been incorporated within the construction design wall level in accordance with the CIRIA guidance.

- The design level of 93.275m AOD has been demonstrated to provide additional capacity to the requirement containment volume. The wall height shall be review and checked during the construction phase to ensure compliance in the As-Built scenario.

9.0 SITE CLASSIFICATION

The following section shall follow the risk assessment methodology set out within CIRIA C736.

This will be done as a three-tier risk-based classification system for secondary and tertiary containment.

The outcome of this will provide a standard of construction, or level of performance in accordance with each of the three levels of risk.

The following diagrams set out the methodology of the risk assessment to determining the Classification.

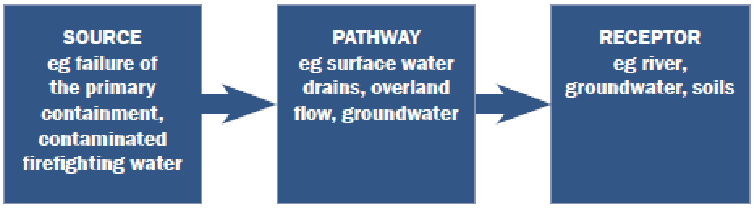


Figure 2.2 Source–pathway–receptor model

The concept of the source–pathway–receptor model is illustrated in Figure 2.3.

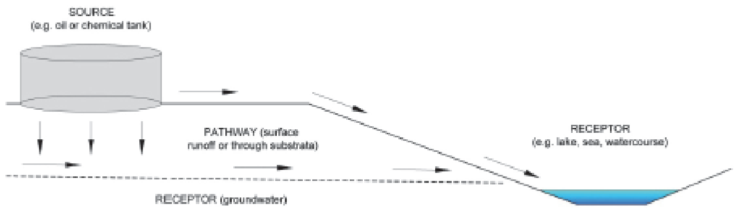


Figure 2.3 Concept of the source–pathway–receptor model

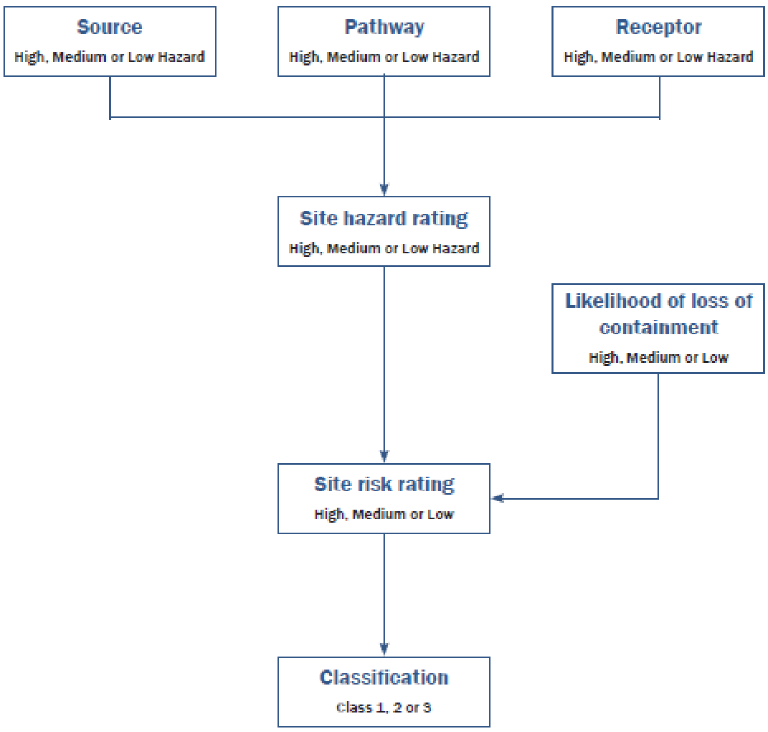


Figure 2.5 Risk assessment framework

9.1 SOURCE

The source material is energy crops and digestate. This is an organic rich material.

The material is classified as non-hazardous.

Given the above, it has been deemed the material shall be classified with a **LOW** environmental hazard rating.

9.2 PATHWAY

The following pathways shall be considered, as part of these pathways the main receptors location in relation to the site shall also be considered.

1. Overland flows.
2. Existing sewers.
3. Ground Conditions
4. Below Ground Pipework

9.2.1 OVERLAND FLOWS

The tank farm benefits from a perimeter bund, made of reinforced concrete walls, which shall be construction in accordance with CIRIA C736.

The internal area has a full hard surfacing.

Overground flow will therefore be contained within the confines for the perimeter bund.

Surge has been considered as part of the bund calculations with compliance with the requirements set out in the CIRIA guidance.

The risk from overland flows is therefore considered LOW

9.2.2 EXISTING SEWERS

The site has no existing sewer connection.

No local sewers are present on the site or the surrounding area.

The risk from sewers is therefore considered LOW

9.2.3 GROUND CONDITIONS

The site is underlying by permeable chalk which will not act as an impermeable barrier. The chalk lenses which would act as a pathway.

It shall be considered, the risk to the ground water shall be taken as High.

Therefore, the risk of ground contamination is considered HIGH.

9.2.5 BELOW GROUND PIPEWORK

The site is underlying by permeable chalk which will not act as an impermeable barrier. The chalk lenses which would act as a pathway.

All process pipework shall be placed above ground with only drainage pipes below ground. These shall be CCTV's before use and air tested.

Therefore, the risk of ground contamination is considered MEDIUM.

9.2.4 PATHWAY RISK CONSIDERATION

From the above the pathways is deemed to be High risk. these do however relay on the integrity of the perimeter bund & hardstanding.

9.3 RECEPTOR

The receptors are;

1. Water Table.

The water table is environmentally sensitive; the presence of permeable chalk lens provides a pathway to the water table.

The site shall be constructed with a full internal concrete hardstanding, reinforced concrete bunding all compliant to CIRICA C736, this secondary containment system will from a second line of defence.

Based on an unlikely failure event the risk shall be considered as High, however in normal operation the site is considered to be low risk to the receptors.

It can therefore be concluded for this particular event, the risk to the receptor shall be considered medium taking a conservative approach between the two events.

In the event of an unlikely failure event the tank & the bunding. The water table would become engulfed with contaminated material.

Given its unlikely event, it is not recommended that further actions are taken to help / protect against such events. However, it is noted that a HDPE membrane has been included under the full containment bund plan area which will offer a third level of containment. Would normally be considered for this reason.

It is therefore essential that the bund integrity forms a vital part of the plant maintenance and inspection schedule, with all reported defects responded to as a matter of the highest importance.

Therefore, after reviewing all the receptors, an overall risk has been concluded as HIGH.

9.4 SITE HAZARD RATING

The site hazard rating shall be assessed using the below table from CIRIA C736, with the following ratings, derived as above.

1. Source - Low
2. Pathway - High
3. Receptor - High

Box 2.1 Suggested combinations of hazard ratings to give overall site hazard rating

Environmental hazard ratings		
H = High rating		
M = Moderate rating		
L = Low rating		
Source	**Pathway**	**Receptor**
(hazard rating)	(transport potential)	(damage potential)
May be H, M or L	May be H, M or L	May be H, M or L
Possible combination of ratings:		**Suggested consequent overall site hazard rating:**
HHH or HHM or HMM		**HIGH**
HHL or MMM or HML		**MODERATE**
MML or HLL or MILL or LLL		**LOW**

Therefore, an overall site hazard rating has been considered and concluded as MODERATE.

9.5 SITE RISK RATING

The site risk rating considers the site hazard rating and the risk of loss of containment.

The site hazard rating has been deemed moderate.

The risk of loss of containment shall now be considered and this is done by using the below table.

Table 2.3 Frequency of loss of containment

Risk of loss of containment	Annual probability of loss of containment per site
High	Greater than 1% (1 in 100)
Medium	Between 1% (1 in 100) and 0.001% (1 in 1 million)
Low	Less than 0.001% (1 in 1 million)

The following simple table has been formulated considering events and their probability in relation to the above table from CIRIA C736

	High	Medium	Low
Small Spills	X		
Pump failure	X		
Pipe Failure		X	
Localised Flooding		X	
Site-wide Fires			X
Whole vessel failure			X
Major flooding			X
Vandalism			X
Subsidence			X
Terrorism			X
Plane Crash			X
Earthquake			X

From the above table it has been concluded a likely risk of loss of containment shall be taken as medium to be conservative.

These two risks shall now be put into the following table to conclude a Site Risk Rating.

Box 2.2 Overall site risk rating as defined by combining ratings of site hazard and probability of containment failure

Site hazard ratings
May be high (H), moderate (M) or low (L) (see Box 2.1)

Frequency of loss of containment
May be high (H), moderate (M) or low (L)

Possible combination of ratings:	**Suggested consequent overall site hazard rating:**
HH or HM or MH	**HIGH**
MM or HL or LH	**MODERATE**
LL or ML or LM	**LOW**

Therefore, an overall site risk rating has been considered and concluded as MODERATE.

9.6 CLASSIFICATION CONCLUSION

The CIRIA guidance sets out that there is no direct quantifiable link between the site hazard or site risk and the design of the containment system. The following simple relationship is considered appropriate in most circumstances:

- low overall site risk containment type **class 1**, ie base level of integrity
- moderate overall site risk containment type **class 2**, ie intermediate degree of integrity
- high overall site risk containment type **class 3**, ie highest degree of integrity.

Therefore, an overall site classification has been considered and found to be moderate, with an overall site risk containment type requirement of class 2, i.e. providing an intermediate degree of integrity.

9.7 KEY PERFORMANCE RECOMMEDATION BY CLASS

The site risk assessment has concluded an overall site hazard rating as being MODERATE. Class 2 containment would be required.

Therefore, the following Table 6.5, will be used to assess the as-built containment.

Table 6.5 Summary of key performance recommendations by class

Recommendation		Containment class		
		Class 2	*Class 2*	*Class 3*
a	Provide not less than 750 mm clearance between primary tank and bund walls for maintenance access.	Desirable	Recommended	Recommended
b	System to detect leakage from primary tank in situations where not practicable to provide clearance between base of tank and bund.	Desirable	Desirable	Recommended
c	No structure within bund to be closer than its own height to the bund wall.	Not necessary	Desirable	Recommended
d	Pumps*, valves, couplings, delivery nozzles and other items associated with the operation of a primary container to be located inside the bund or within a separately bunded area.	Desirable	Recommended	Recommended
e	Penetrations of the bund wall to be avoided.	Desirable	Recommended	Recommended
f	No provision for rainwater draw-off via a valved outlet in bund wall.	Desirable	Recommended	Recommended
g	Take account of possible jetting failure.	Desirable	Recommended	Recommended
h	Take account of surge effects.	Desirable	Desirable	Recommended

a. A minimum 750mm clearance has been provided between all tanks and the bund wall for maintenance. **– Achieved**

b. The main tanks do not have any leak detection system where the tank bases are below the bund. **– All tank are above the containment system or a HDPE membrane has been placed below the tank.**

c. Not all the tanks are beyond their own height to the bund wall. One of the three digester tanks is located 1.5m away from the bund wall, with the tank heights been 9.0m. This requirement is a desirable recommendation which has been complied with in three directions. Bund wall heights have achieved the required surge effects. Therefore, the design has considered this requirement. **- Achieved**

d. Below ground transfer pipes between the primary container are located below the bund slab. These are construction in MDPE. **– Achieved, all pipework shall be placed above ground**

e. There are no penetrations of the bund walls. **- Achieved**

f. No rainwater draw-off point has been provided. **- Achieved**

g. Jetting has been considered, with the tank insulation and cladding system offering a line of defence against jetting affect. The maintenance and operation team will be able to monitor loss of volume via the SCADA system. It is also recommended that visual site walkovers are undertaken to look out for wall pooling at the bottom of the tank cladding. - **Achieved**

h. Surge effects have been considered and applied in line with the recommendation set out in the CIRIA guidance in absence of detailed analysis. **- Achieved**

10.0 BUND CONSTRUCTION DESIGN

The following section shall provide a descriptive description of the proposed construction containment system, covering the perimeter, secondary, leak detection and any form of additional containment.

Primary Containment

The bund shall contain 5 main tanks which are to be constructed by A-Consult using a precast post tension wall construction with a cast insitu slab.

The tanks shall sit slightly below the main containment slab due to the floor falls to aid in drainage to the south / collection pit. Given the tank is located below the bund slab a leak detection system with has been incorporated by A-Consult to allow for leak detection of each tank. This system shall be sealed to prevent leaks escaping into the lower HDPE membrane and or liquid flowing into the system from above (rainfall)

See Appendix IV for A-Consult details.

Secondary Containment

Perimeter Walls

The containment bund walls have all been designed in accordance with CIRIA C736 at the Environment Agency's Best Available Technic (BAT).

The wall height has been determined based on the provided tank numbers and volumes as outlined within section 4.0 – 8.0.

All vertical & horizontal joints within the bund wall shall have a waterbar cast to the middle of the wall at and both faces to have sealant applied to the full height.

Expansion joints shall be placed at maximum spacing of 18m. A waterbar shall be placed vertically in the wall joint and base.

The Contractor shall construct in accordance with the supplier construction drawing and GGP Consult shall perform a CQA role during the construction phase to ensure compliance.

See Appendix V for GGP Consult details.

Bund Floor Slab

The floor slab shall be constructed from a 175mm fibre reinforced concrete slab with a layer of A393 mesh. A specialist fibre contractor has provided a design mix for the fibres which can be see within Appendix V.

The final mix design shall be submitted for review and approval by GGP Consult before accepting any concrete on site.

The bund slab shall form a fully sealed water retaining structure, with all joints between the bund slab, walls & tank bases sealed with a Fosroc or similar approved by GGP Consult.

All joints within the bund slab and intersection with the perimeter retaining wall shall have a waterbar at the bottom and sealant to the top surface.

Additional Containment

A 1.0mm HDPE membrane shall be placed below the full bund slab area, with all joints lapped, welded and certified to form a fully sealed liner. This shall provide an enhanced composite secondary containment slab and the ability to perform leak detection on the secondary containment with any failures of the bund slab been trapped between the slab and HDPE membrane allowing for sampling.

See Appendix V for GGP Consult details.

Drainage

All drainage within the containment system shall be located above the 1.0mm HDPE membrane, with pipes, channels & chambers to have minimum 175mm concrete surround.

Where the intersection between pours and the bund slab, a Adcor waterstop shall be provided to the liner perimeter.

Drainage channel shall be BSI certified with loading rate of E600, installation shall be strictly in accordance with the manufactures details. All joints shall be sealed through the system.

All manholes shall be BSI kitemarked, D400 lids and double sealed.

Precast concrete chambers shall have a minimum internal diameter of 1200mm and be constructed in accordance with the standard details provided.

Where Precast concrete chambers are used within the defined dirty water system, all chambers are to be internally sealed / lined to ensure sealed rings and prevent deterioration of the concrete.

Plastic chambers shall hold a BSI kitemark certification and shall have a minimum internal diameter of 450mm.

All pipes shall be PVC-U or similar material approved by GGP Consult and all drainage pipes should be sealed, and pressure tested (water & air) prior to completion.

All below ground tanks shall have up & downstream penstock valves fitting to allow isolation of the tank.

The below ground effluent tank shall have a secondary liner under the full extent of the tank, carried up to the surface and sealed. A leak detection point shall be provided between the tank and the liner.

See Appendix VI for GGP Consult details.

11.0 SUMMARY AND COMPLIANCE STATEMENT

It has been demonstrated within the report that the sites containment system has been designed in compliance with the recommendation and guidance set out within CIRIA C736.

The site hazard rating has been concluded as moderate with a minimum requirement of Class 2 containment system required.

The constructed containment system is in compliance with a class 2.

The proposed design bund wall level of 93.300m AOD will contain the 25% volume.

The containment system shall be inspection via a CQA role performed by GGP Consult with a written compliance report confirming the As-Built containment has complied with the design.

The operator shall conform to the proposed maintenance schedule and undertake work immediately.

From GGP CONSULT

Report Checked by:-

JHcollins

J. H. Collins BSc. (Hons), MCIWEM

Associate Director - Drainage & Infrastructure

APPENDIX I

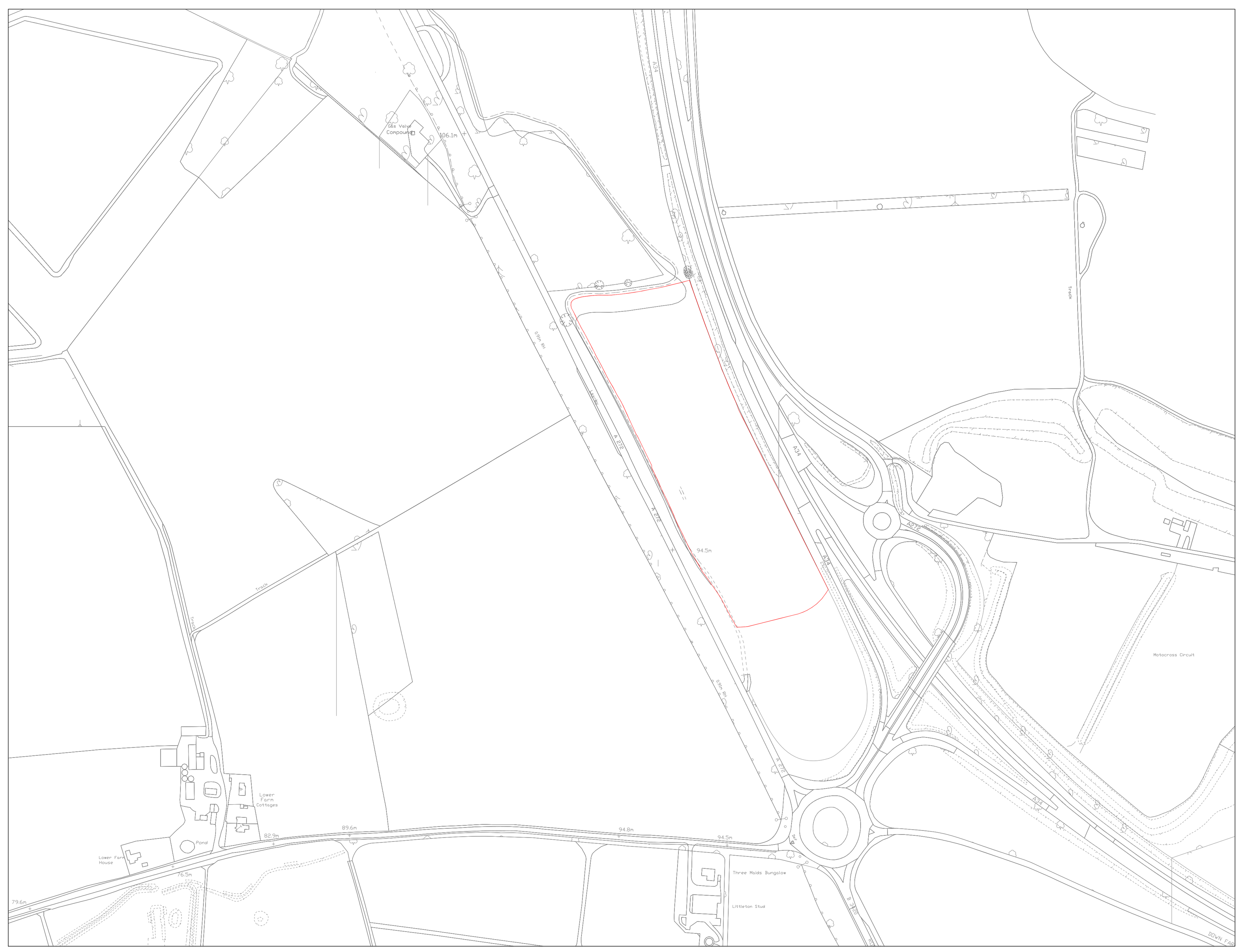
Layout Showing Tank Sizes

AS NOTED ON A1 FRAME

N

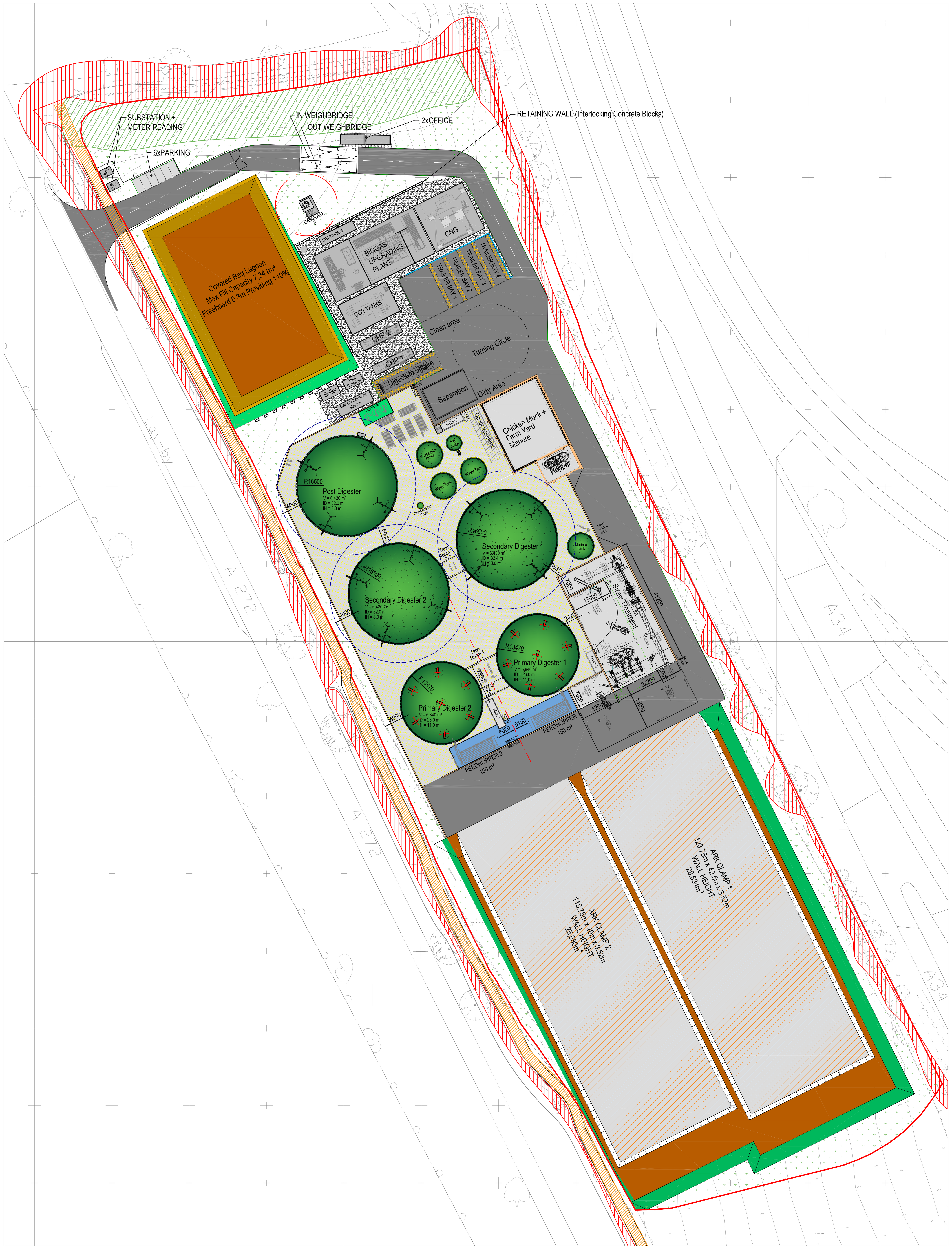
0 50m 100m 150m 200m 250m

Scale 1:5000 @ A1



SITE LOCATION PLAN

Scale: 1:5000 @ A1



SITE PLAN

Scale: 1:750 @ A1

FOR CONSTRUCTION

NOTES:-

1. All dimensions must be checked on site and not scaled from this drawing.
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. This drawing is to be read in conjunction with 29348/100 Series Drawings.
5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

Site Red Line Boundary (4.453ha)

15m Woodland Easement

Tree Easement

Rev	Date	Description	DR	CH
C6	26/01/24	Tanking Layout amended	MK	JHC
C5	15/01/24	Odour moved	MK	JHC
C4	11/01/24	Switchgear updated to 40ft	MK	JHC
C3	11/01/24	Separation changed	MK	JHC
C2	18/12/23	ISSUED FOR CONSTRUCTION	MK	JHC
C1	08/12/23	ISSUED FOR CONSTRUCTION	MK	JHC

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United Kingdom

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Fax (+44) 01482 641736
Email info@ggpconsult.co.uk

Client: acorn

Job Title

AD Plant.
Three Maids

Drawing Title

Site Layout Plan

Status: For Construction

Scale: AS NOTED @ A1

Date: DEC' '23

Drawn By: MK

Checked: JHC

Approved: JHC

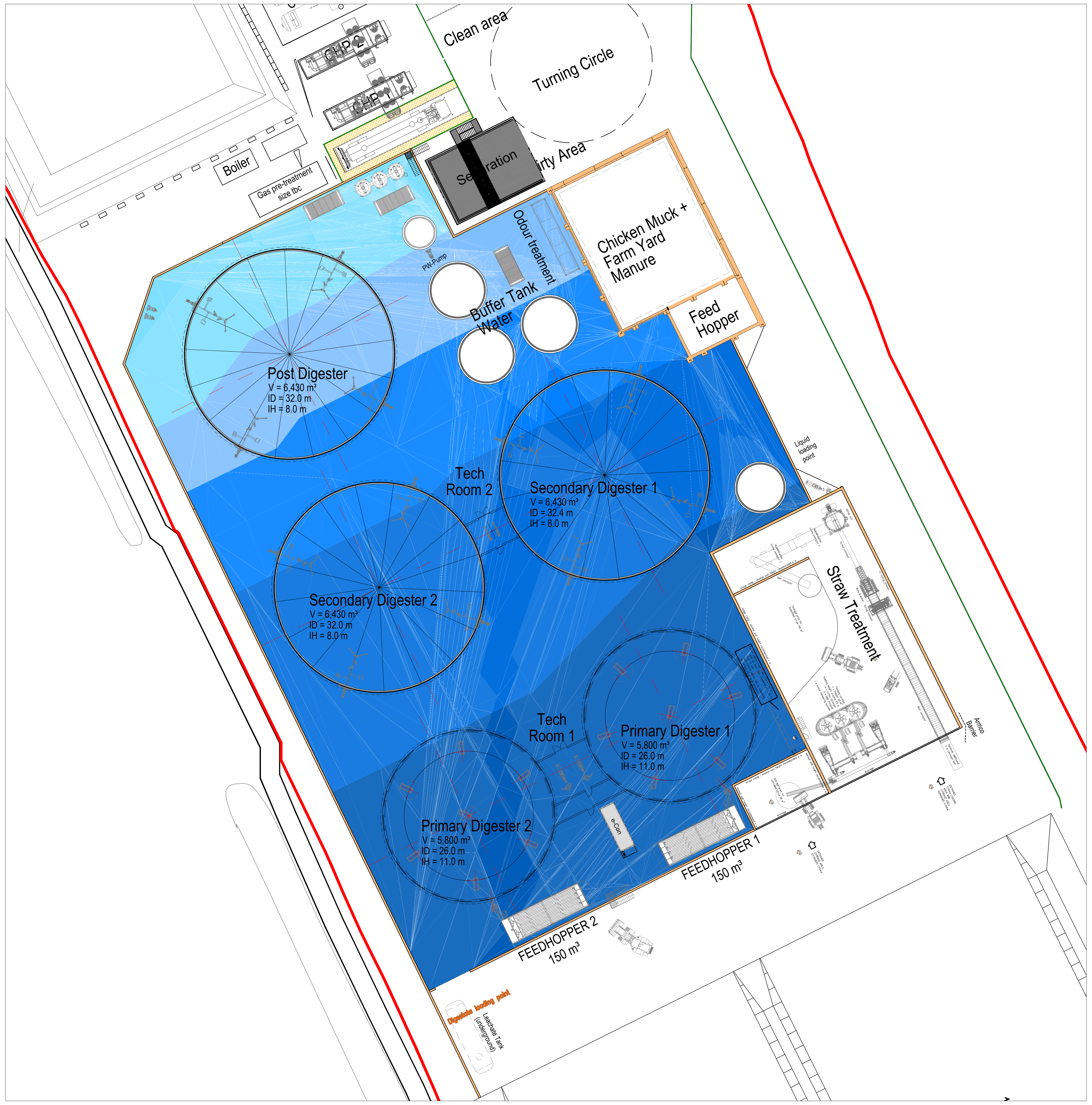
Drg. No.: 29348/C/101

Rev: C6

APPENDIX II

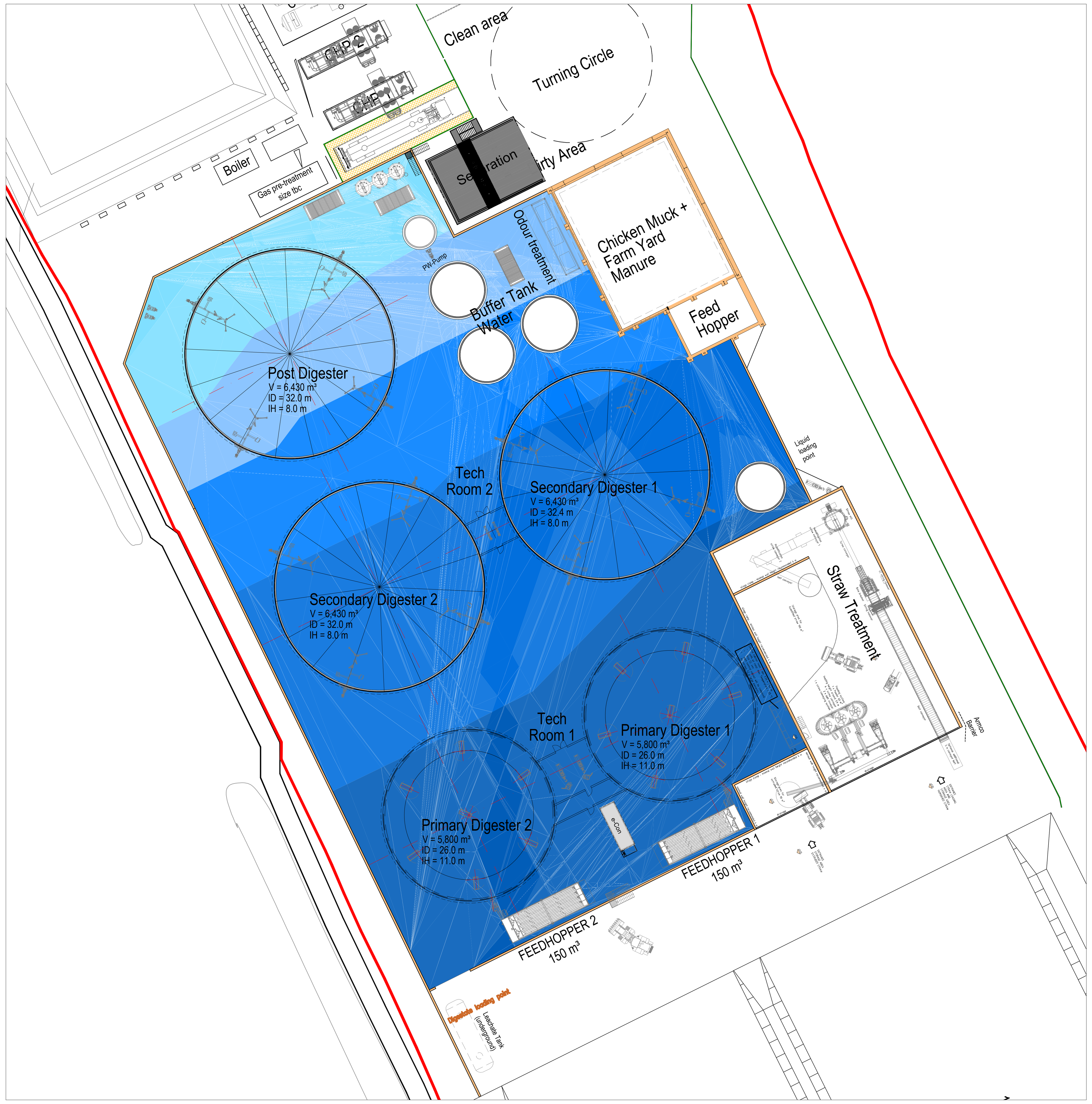
2D Volume Visualisation

AS NOTED ON A1 FRAME



TANK BUND LAYOUT (LIQUID UPTO LEVEL +93.025m)

Scale: 1:500 @ A1



TANK BUND LAYOUT (LIQUID UPTO LEVEL +93.275m)

Scale: 1:500 @ A1

upto level 93.025

SURFACE LEVEL DATA

NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA
1	0.82	0.94		756.508m2
2	0.94	1.04		909.958m2
3	1.04	1.16		1233.899m2
4	1.16	1.26		2608.679m2
5	1.26	1.38		2400.654m2

Total Volume = 9257 m³

upto level 93.275

SURFACE LEVEL DATA

NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA
1	1.08	1.18		756.508m2
2	1.18	1.30		909.958m2
3	1.30	1.40		1233.899m2
4	1.40	1.52		2608.679m2
5	1.52	1.62		2400.654m2

Total Volume = 11234 m³

FOR CONSTRUCTION

NOTES:-

1. All dimensions must be checked on site and not scaled from this drawing.
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. This drawing is to be read in conjunction with 29348/100 Series Drawings.
5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

Site Red Line Boundary

N

Rev	Date	Description	DR	CH
C2	24/01/24	ISSUED FOR CONSTRUCTION	MK	JHC
C1	18/01/24	ISSUED FOR CONSTRUCTION	MK	JHC

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Priory Park East
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Fax (44) 01482 641736
Email info@ggpconsult.co.uk

Client
acorn

Job Title
AD Plant.
Three Maids

Drawing Title
Volume Calculation for Bund Area

Status: For Construction

Scale: AS NOTED @ A1

Date: JAN' '24

Drawn By: MK

Checked: JHC

Approved: JHC

Drg. No.: 29348/C/2024

Rev: C2

APPENDIX III

Proposed Site Levels

AS NOTED ON A1 FRAME

SITE PLAN
Scale: 1:750 @ A1

FOR CONSTRUCTION

NOTES:-

1. All dimensions must be checked on site and not scaled from this drawing.
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. This drawing is to be read in conjunction with 29348/100 Series Drawings.
5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

Site Red Line Boundary

T.O.C. : Denotes Top Of Concrete
T.O.W. : Denotes Top Of Wall
F.F.L. : Denotes Finished Level

+XX.XXX Denotes top of kerb level
+XX.XXX Denotes finished ground level
+XX.XXX Denotes top of concrete levels

Rev	Date	Description	DR	CH
C4	26/01/24	Tanking layout and bund wall levels adjusted	JTK	JHC
C3	17/01/24	Level adjustment with OBM	WG	JHC
C2	15/01/24	Separation area changed	WG	JHC
C1	18/12/23	ISSUED FOR CONSTRUCTION	WG	JHC

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Email info@ggpconsult.co.uk

Client
acorn

Job Title
AD Plant.
Three Maids

Drawing Title
Proposed Site Levels

Status
For Construction

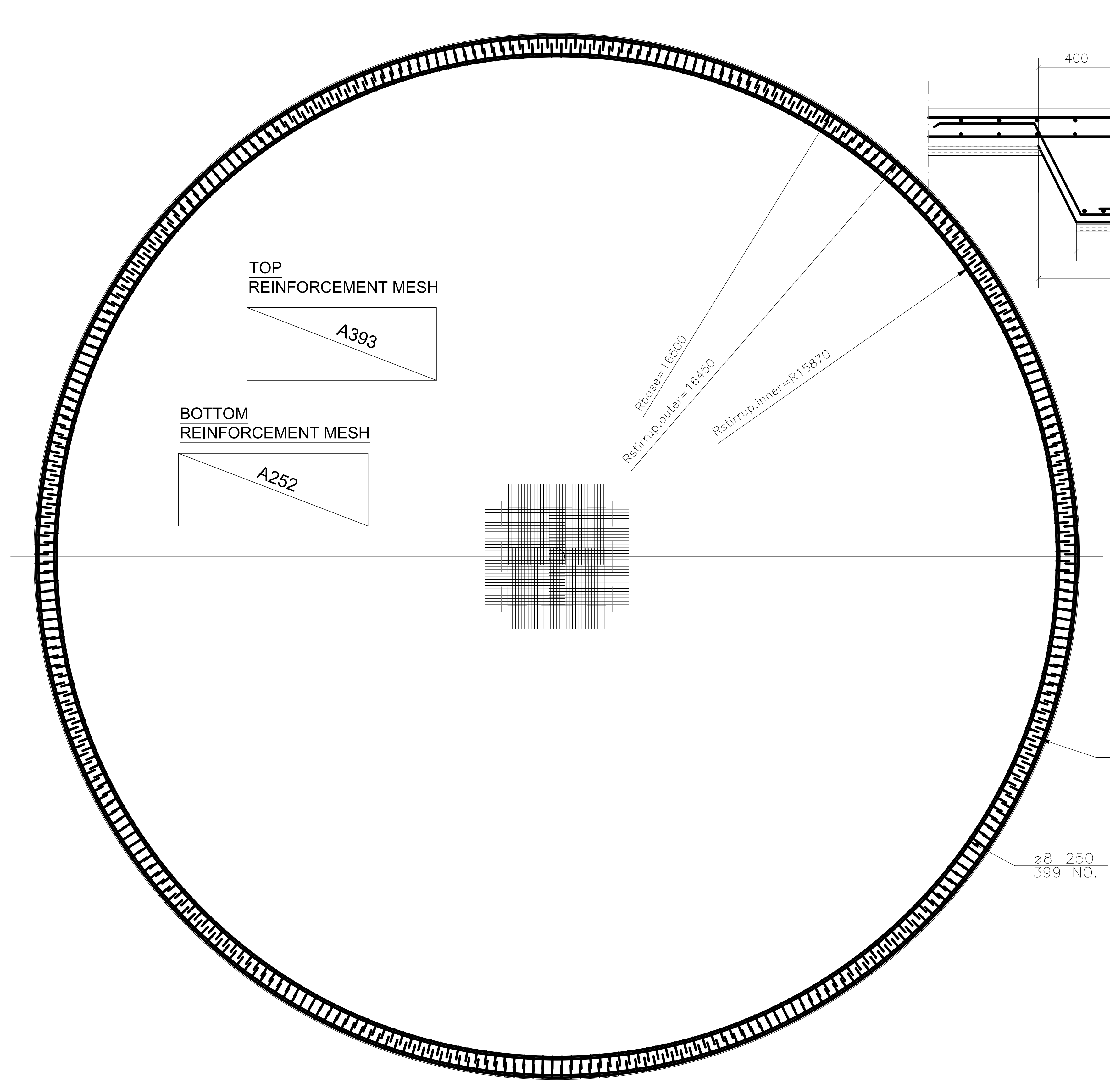
Scale: AS NOTED @ A1
Date: DEC' '23

Drawn By: WG
Checked: JHC
Approved: JHC

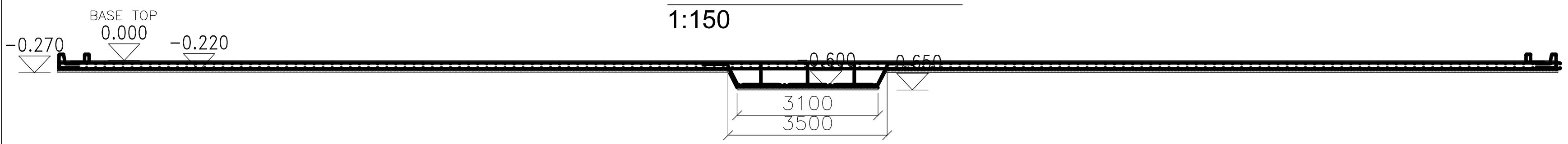
Drg. No.: 29348/C/108
Rev: C4

APPENDIX IV

Primary Containment – A-Consult Tanks

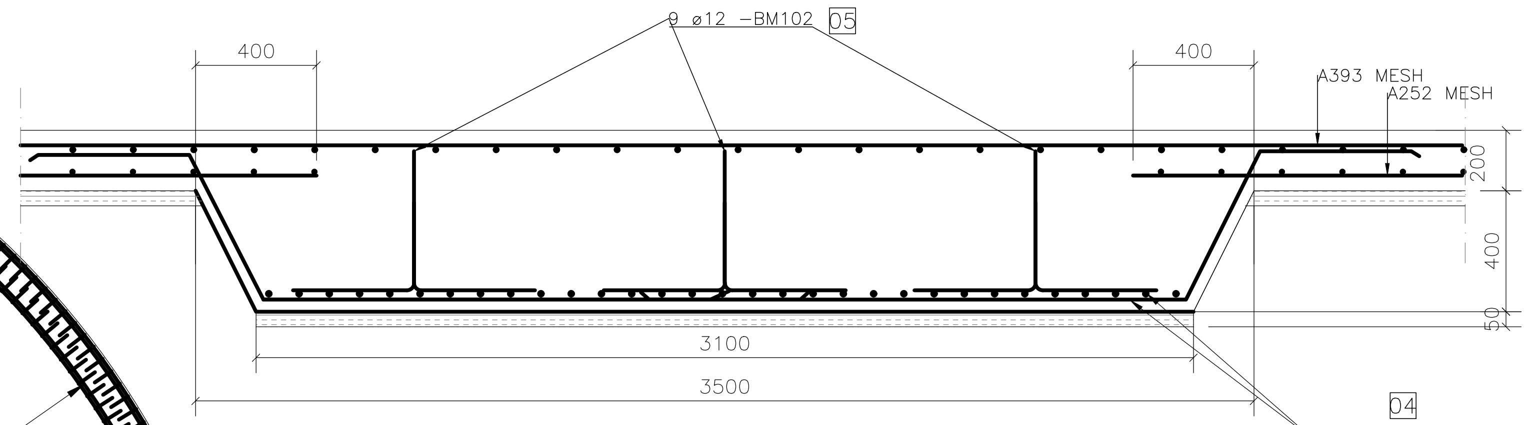


BASE REINFORCEMENT
1:150

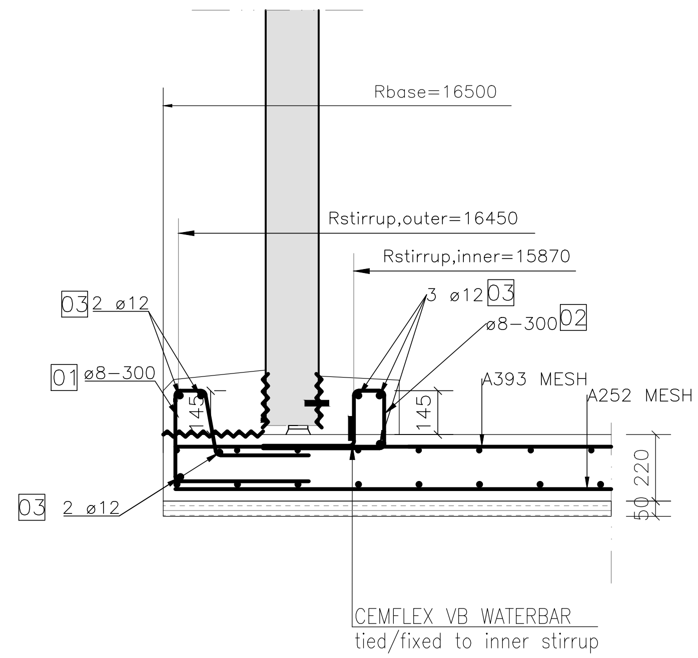


BEARING CAPACITY 200 kN/m²
for the base slab og centre strengthening

SECTION A-A
1:150



REINFORCEMENT UNDER COLUMN
1:25



JOINT BETWEEN WALL AND BASE
REINFORCEMENT
1:25

REV.:	DESCRIPTION:	INIT.:	DATE:
B	bearing capacity	SV	2024.01.16
A	FIRST ISSUE	SV	2024.01.11

NOTE:		GENERAL NOTES:
BASE CONCRETE:	C28/35	ALL DIMENSIONS IN MILLIMETRES, NO DIMENSIONS IS TO BE SCALED FROM THE DRAWING.
EXPOSURE CLASS:	XC4, XF3, XA1	GROUND UNDER BASE SLAB: WELL COMPACTED FREE DRAWING MATERIALS/LEVELLED TO +/- 10 mm
REINFORCEMENT:	Fyk=min 500MPa	
COVER TO REINFORCEMENT:	NOM. 40 mm	MINIMUM LAP TO REINFORCEMENT BARS TO BE 40 TIMES BAR DIAMETER UNLESS NOTED OTHERWISE.
SURFACE FINISH:	-	

Client info:
Agraferm

Date: 2024.01.11	Made by: SV	Check by: -	Scale: 1:150

Project no.: 430684
Project name: THREE MAIDS
Constuction place address:

STATUS
FOR MANUFACTURE

Description:
SECONDARY DIGESTERS 1,2,3
BASE REINFORCEMENT DETAIL
TANK TYPE: N8000-47-2B/2

Drg.no.: AQ430684-2-80-47-7301
Issue: B

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The Barn
Manor Business Park
East Drayton DN22 0LG

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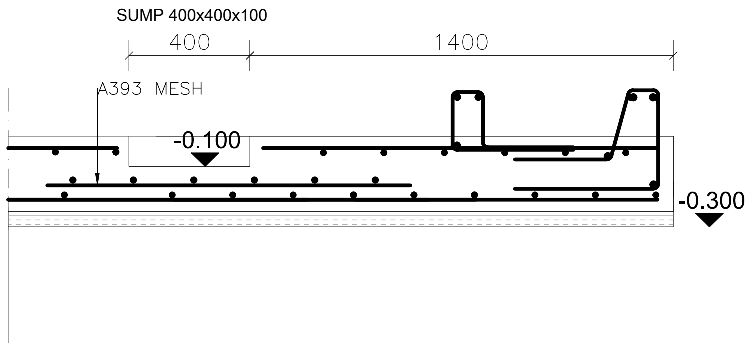
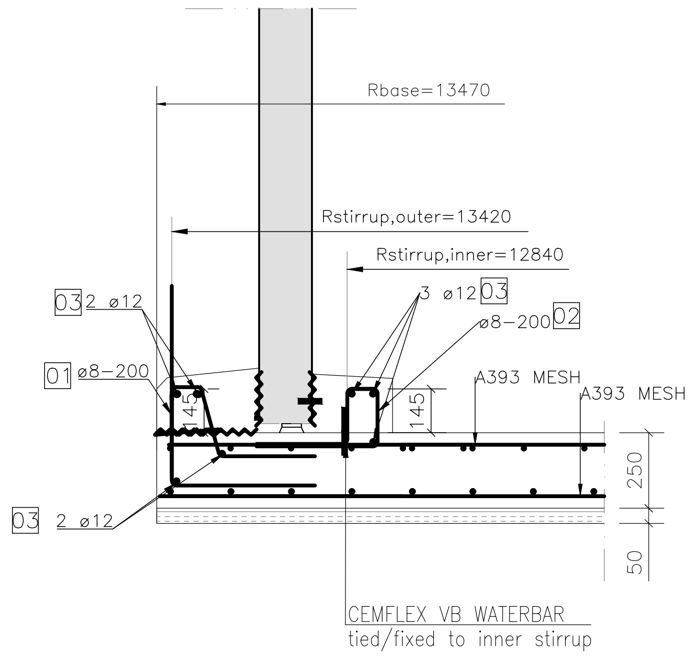
http:// www.aconsult.co.uk

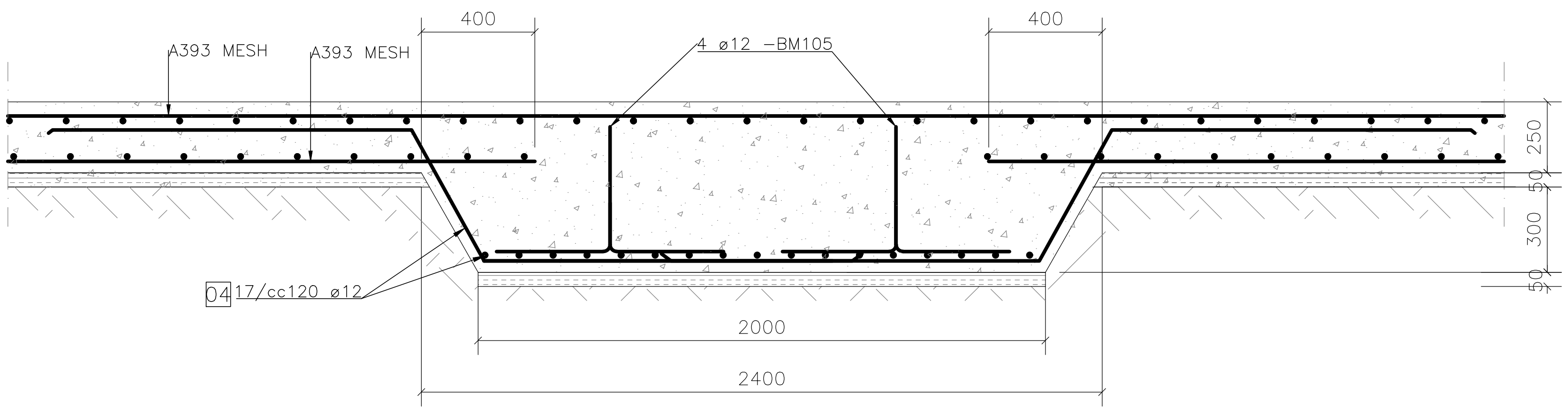
A-CONSULT



BASE / SUMP REINFORCEMENT
1:25



JOINT BETWEEN WALL AND BASE REINFORCEMENT
1:25



REINFORCEMENT UNDER COLUMN
1:25

REV.:	DESCRIPTION:	INIT.:	DATE:
A	FIRST ISSUE	SV	2024.01.11

NOTE:		GENERAL NOTES:
BASE CONCRETE:	C28/35	ALL DIMENSIONS IN MILLIMETRES. NO DIMENSIONS IS TO BE SCALED FROM THE DRAWING.
EXPOSURE CLASS:	XC4, XF3, XA1	GROUND UNDER BASE SLAB: WELL COMPACTED FREE DRAWING MATERIALS/LEVELLED TO +/- 10 mm
REINFORCEMENT:	Fyk=min 500MPa	
COVER TO REINFORCEMENT:	NOM. 40 mm	MINIMUM LAP TO REINFORCEMENT BARS TO BE 40 TIMES BAR DIAMETER UNLESS NOTED OTHERWISE.
SURFACE FINISH:	-	

Client info:
Agraferm

Date: 2024.01.11	Made by: SV	Check by: -	Scale: 1:150

Project no.: 430684
Project name: THREE MAIDS
Constuction place address:

STATUS
FOR MANUFACTURE

Description:
GENERAL LAYOUT. DIGESTER 1,2
BASE REINFORCEMENT DETAIL
TANK TYPE: N11000-37-4B/2

Drg.no.: AQ430684-0-11-37-7302
Issue: A

A-CONSULT Limited
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Manor Business Park
East Drayton DN22 0LG

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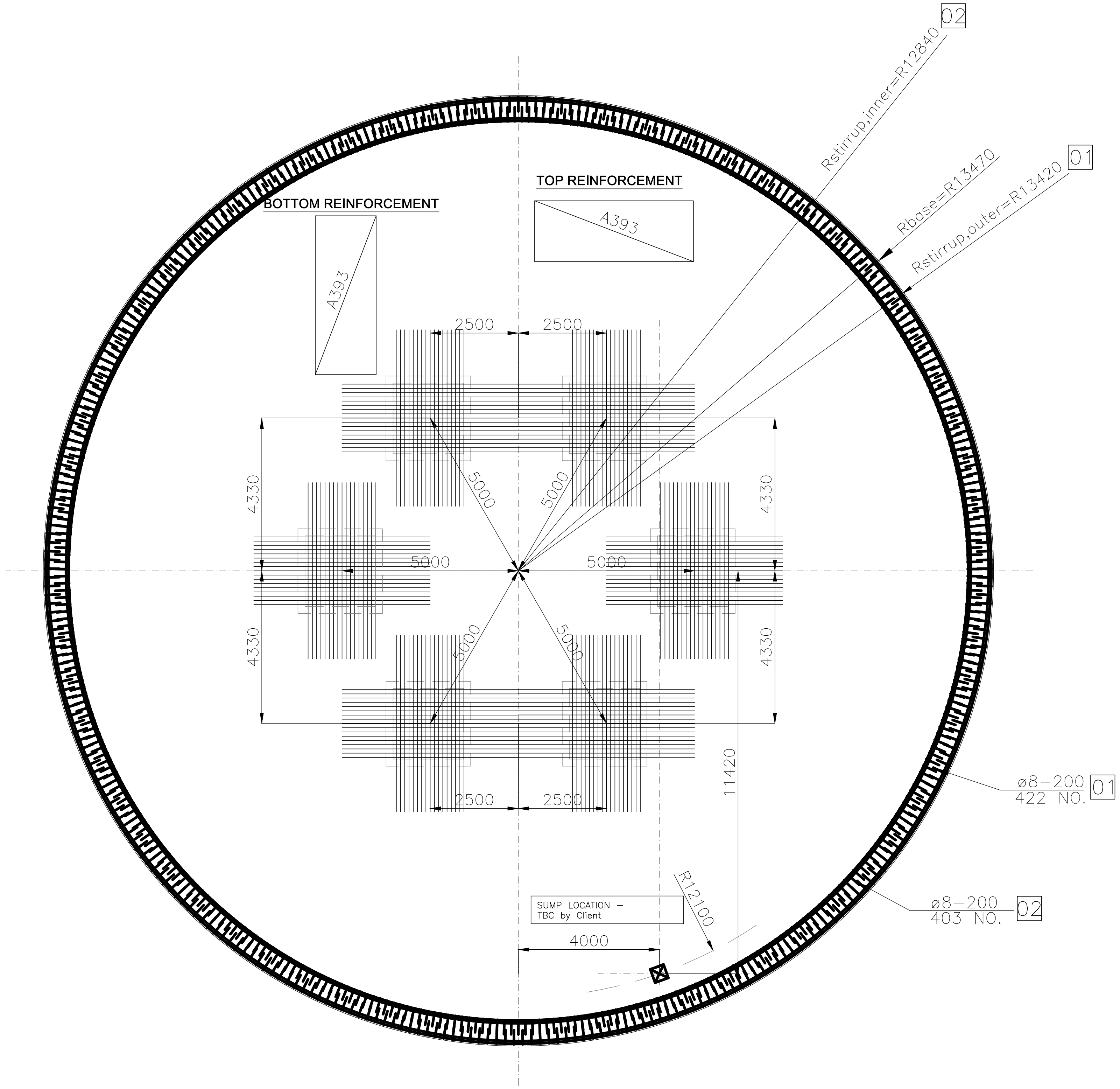
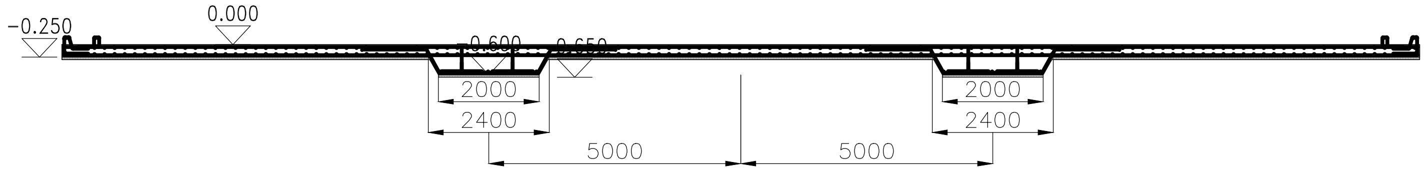
e-mail: info@aconsult.co.uk
http:// www.aconsult.co.uk

A-CONSULT



BASE REINFORCEMENT
1:150



BEARING CAPACITY 200 kN/m²
for the base slab og centre strengthening

SECTION A-A
1:150

REV.:	DESCRIPTION:	INIT.:	DATE:
B	bearing capacity	SV	2024.01.16
A	FIRST ISSUE	SV	2024.01.11

NOTE:		GENERAL NOTES:
BASE CONCRETE:	C28/35	ALL DIMENSIONS IN MILLIMETRES. NO DIMENSIONS IS TO BE SCALED FROM THE DRAWING.
EXPOSURE CLASS:	XC4, XF3, XA1	GROUND UNDER BASE SLAB: WELL COMPACTED FREE DRAWING MATERIALS/LEVELLED TO +/- 10 mm
REINFORCEMENT:	Fyk=min 500MPa	
COVER TO REINFORCEMENT:	NOM. 40 mm	MINIMUM LAP TO REINFORCEMENT BARS TO BE 40 TIMES BAR DIAMETER UNLESS NOTED OTHERWISE.
SURFACE FINISH:	-	

Client info:
Agraferm

Date: 2024.01.11	Made by: SV	Check by: -	Scale: 1:150

Project no.: 430684
Project name: THREE MAIDS
Constuction place address:

STATUS
FOR MANUFACTURE

Description:
GENERAL LAYOUT. DIGESTER 1,2
BASE REINFORCEMENT DETAIL
TANK TYPE: N11000-37-4B/2

Drg.no.: AQ430684-0-11-37-7301
Issue: A

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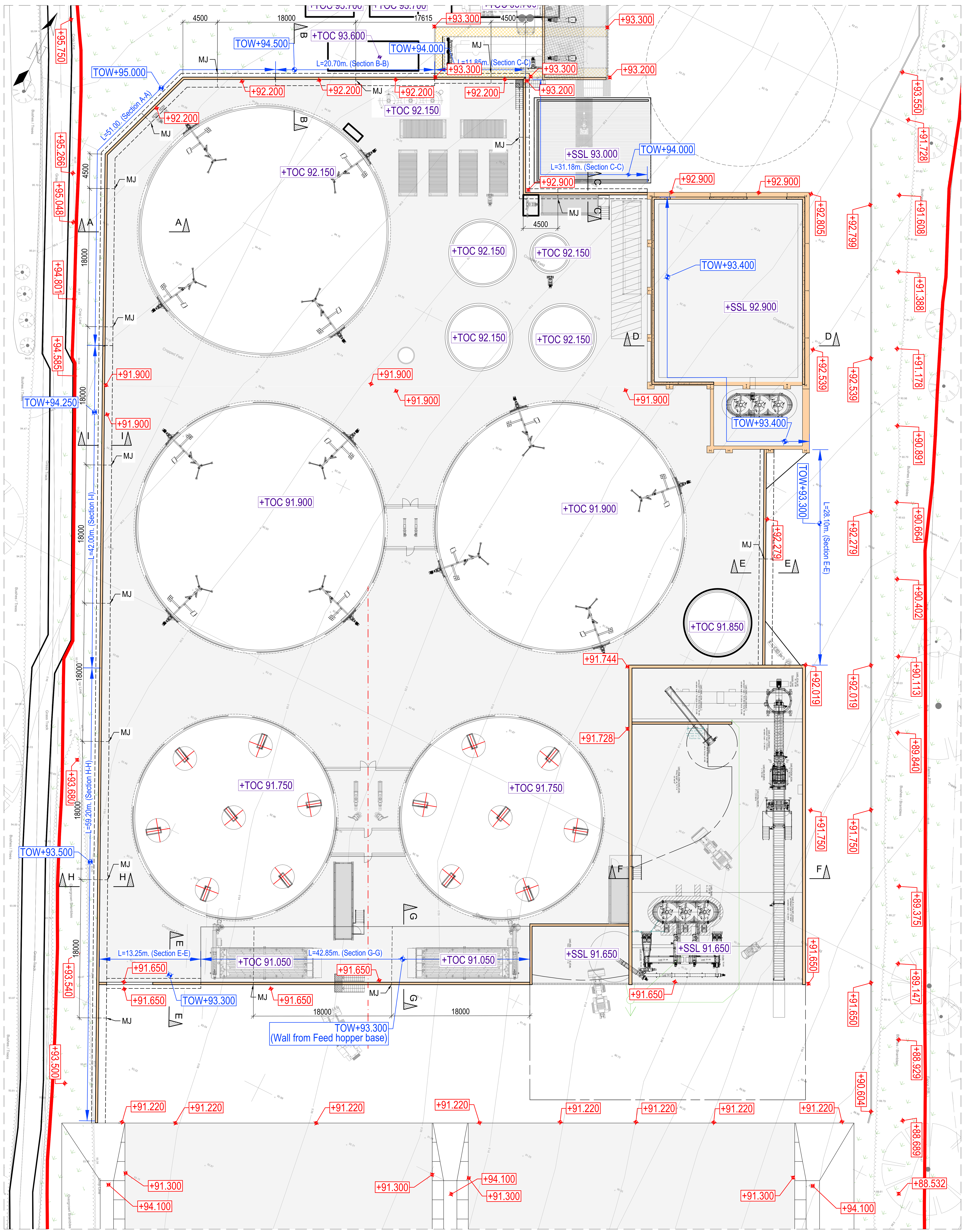
http:// www.aconsult.co.uk

A·CONSULT

APPENDIX V

Secondary Containment Details

AS NOTED ON A1 FRAME



TANK BUND LAYOUT
Scale: 1:300 @ A1

FOR COMMENT

NOTES:-

1. All dimensions must be checked on site and not scaled from this drawing.
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.
5. When The Distance Between The Top Of Bund Wall & External Concrete/Ground Levels is Less Than 1.1m Provide Medium Duty Galvanised Steel Handrailing Fixed to The Top of the Wall. Height of Handrailing Varies to Suit Change in Concrete/Ground Levels.
6. Provide Movement Joints at 10m Centres Along Length of Wall in Accordance With Typical Contraction Joint Detail.
7. 25x25 Chamfer to all Exposed Edges

Site Red Line Boundary

T.O.C. : Denotes Top Of Concrete
T.O.W. : Denotes Top Of Wall
F.F.L. : Denotes Finished Level
M.J. : Denotes Movement Joint

+xx.xxx Denotes top of wall levels
+xx.xxx Denotes finished ground level
+xx.xxx Denotes top of concrete levels

Contractor to Allow For 75kg/m³ of Loose Bar Reinforcement Plus Mesh Reinforcement.

Rev	Date	Description	DR	CH
C2	29/01/24	ISSUED FOR COMMENT	MK	JHC
C1	21/12/23	ISSUED FOR COMMENT	MK	JHC

Constructionline
intertek
Achilles UVDB SILVER PLUS
Audited RISQS
GGP CONSULT
CONSULTING ENGINEERS
ARCHITECTS
PROJECT MANAGEMENT
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Priory Park East
HULL HU4 7DY
United Kingdom
Telephone (+44) 01482 627963
Fax (+44) 01482 641736
Email info@ggpconsult.co.uk

Client
acorn

Job Title
AD Plant.
Three Maids

Drawing Title
Bund Layout

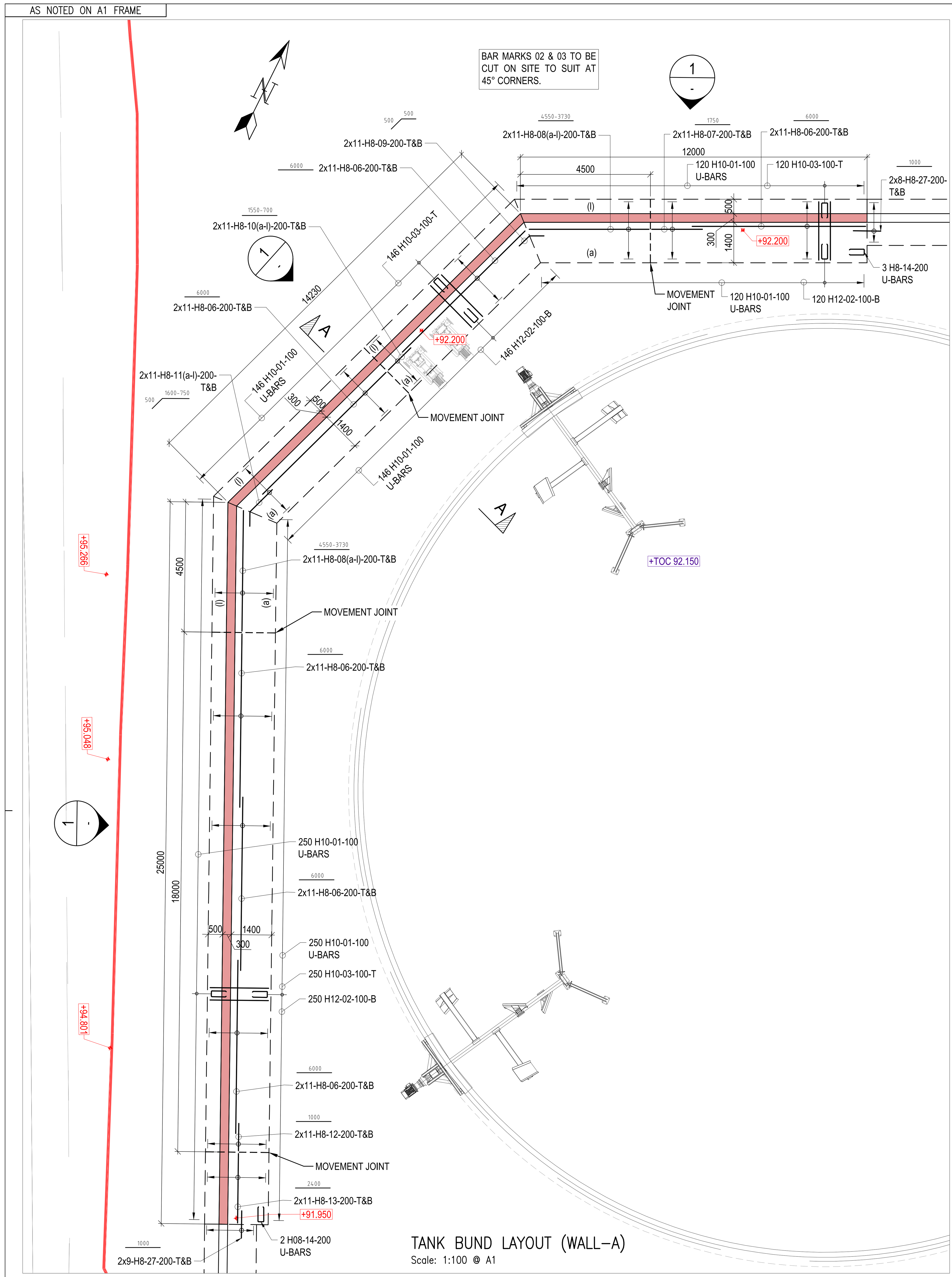
Status: For Comment

Scale: AS NOTED @ A1
Date: DEC' '23

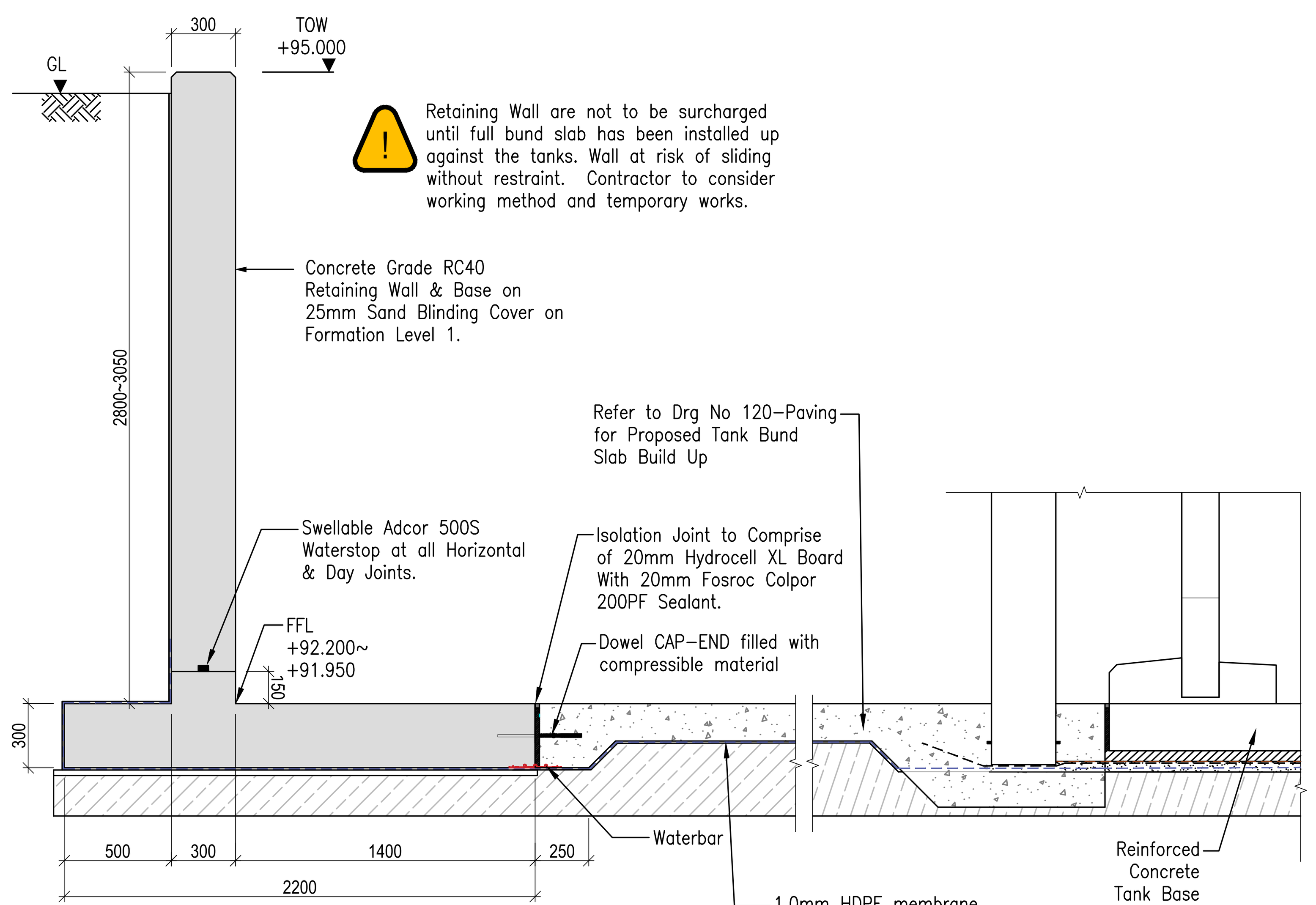
Drawn By: MK
Checked: JHC
Approved: JHC

Drg. No. 29348/C/2019
Rev C2

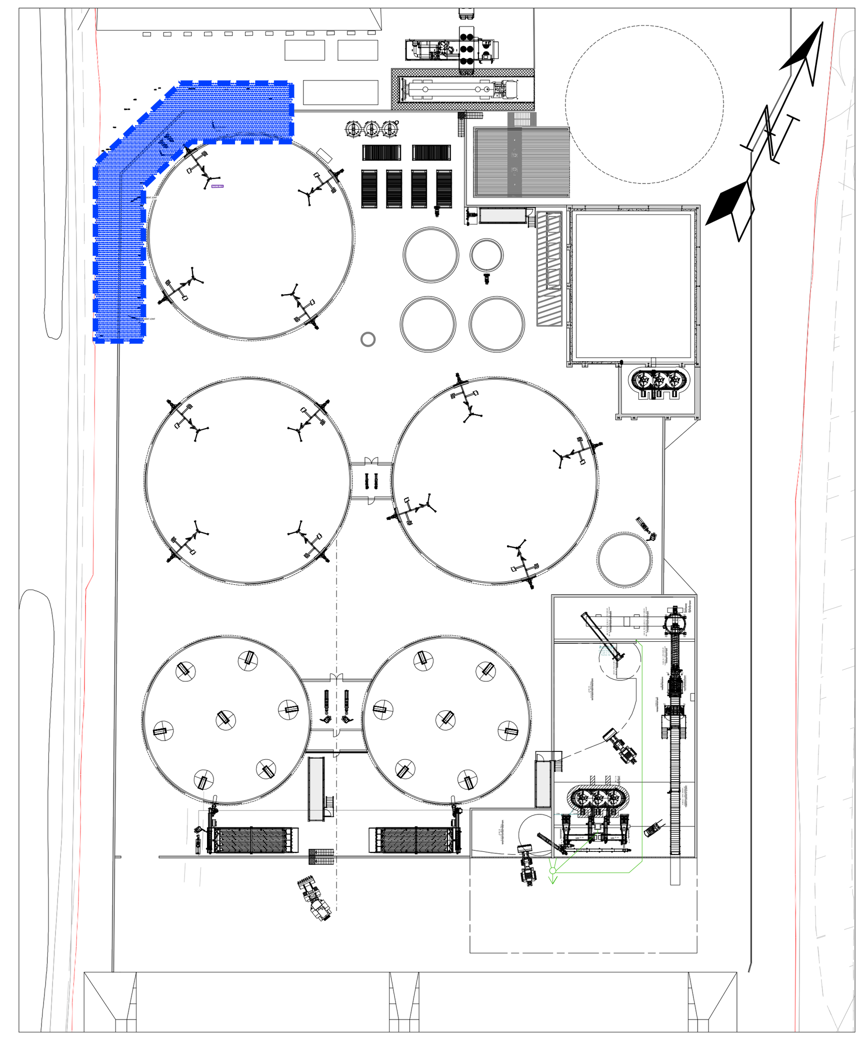
AS NOTED ON A1 FRAME



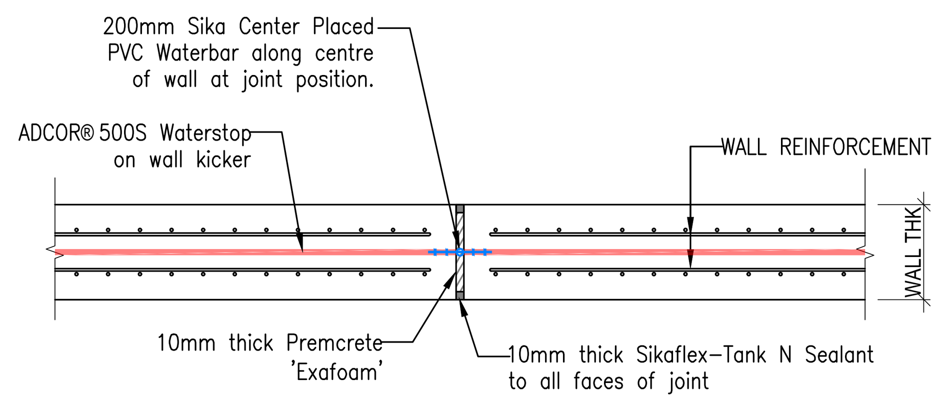
TANK BUND LAYOUT (WALL–A)
Scale: 1:100 @ A1



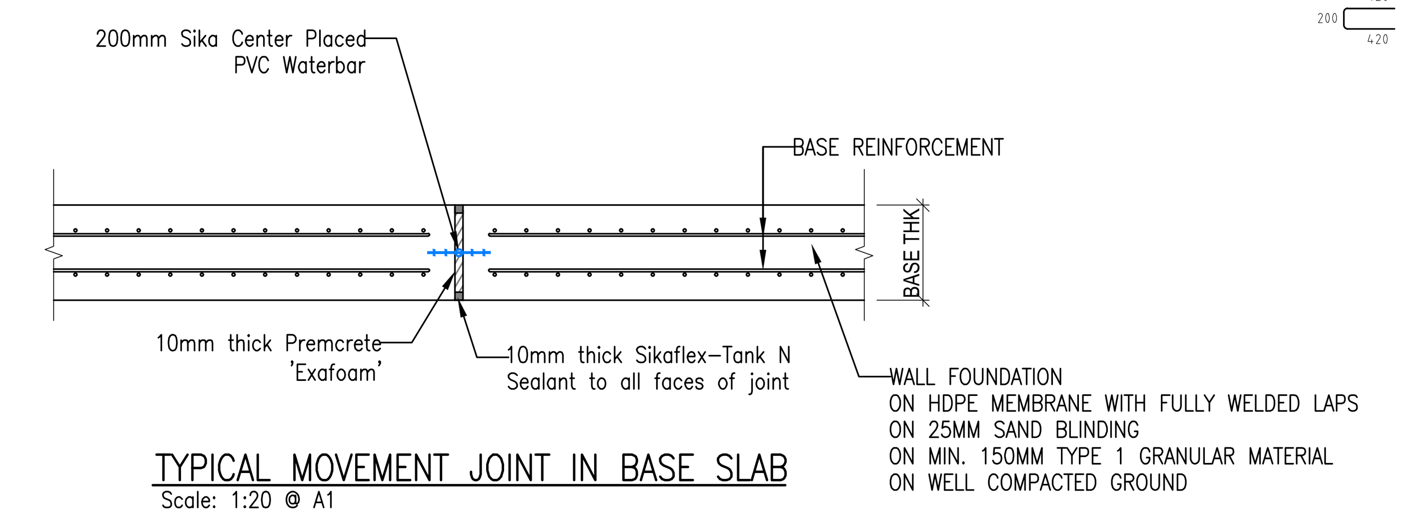
SECTION A–A
Scale: 1:25 @ A1



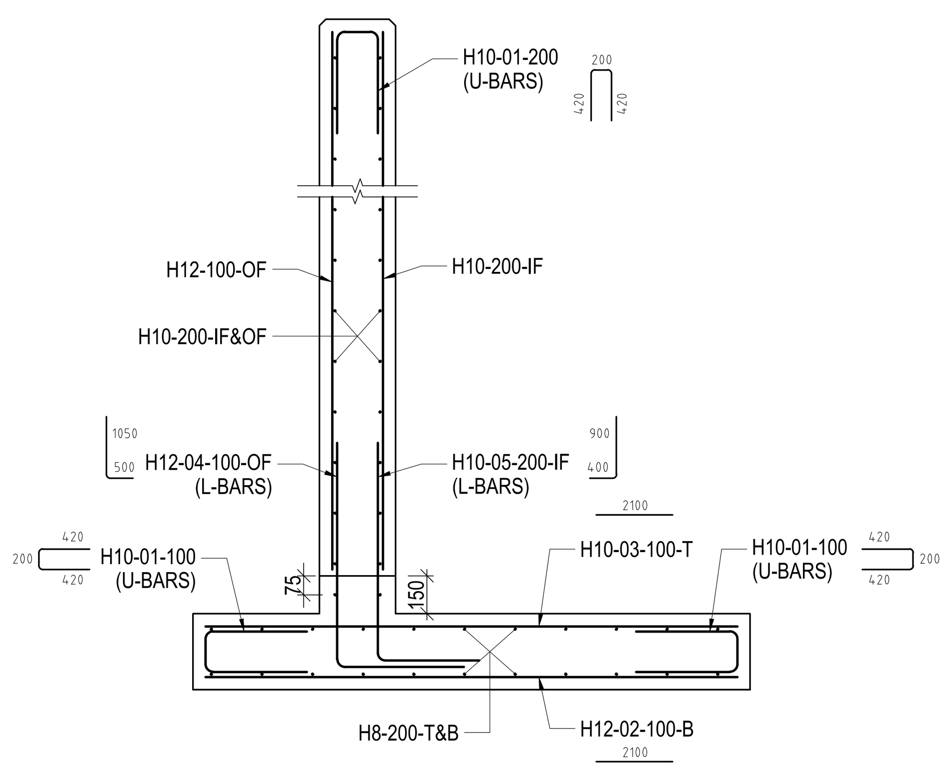
Key Plan
Scale: 1:1000 @ A1



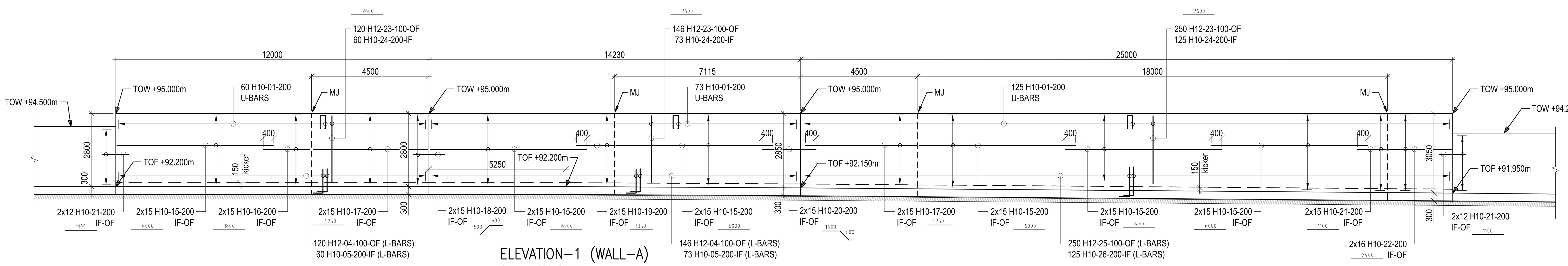
TYPICAL MOVEMENT JOINT IN WALLS
Scale: 1:20 @ A1



TYPICAL MOVEMENT JOINT IN BASE SLAB
Scale: 1:20 @ A1



Typical Reinforcement Section
Scale: 1:25 @ A1



ELEVATION–1 (WALL–A)
Scale: 1:100 @ A1

FOR COMMENT

NOTES:-
1. All dimensions must be checked on site and not scaled from this drawing.
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.
5. When The Distance Between The Top Of Bund Wall & External Concrete/Ground Levels is Less Than 1.1m Provide Medium Duty Galvanised Steel Handrailing Fixed to The Top of the Wall. Height of Handrailing Varies to Suit Change in Concrete/Ground Levels.
6. Provide Movement Joints at 18m Centres Along Length of Wall in Accordance With Typical Contraction Joint Detail.
7. 25x25 Chamfer to all Exposed Edges
8. Concrete cover to reinforcement = 50mm U.N.O
9. Explanation of bar tagging system :

3 H12-10-150-OF (U-Bars) — No. of; Bar type; Bar size; Centres; Bar tag; Remarks; Bar Location

Site Red Line Boundary

T.O.W. : Denotes Top Of Wall
T.O.F. : Denotes Top Of Foundation
T.O.C. : Denotes Top Of Concrete
F.F.L. : Denotes Finished Level
G.L. : Denotes Ground Level
I.F. : Denotes Inner Face
O.F. : Denotes Outer Face
T : Denotes Top
B : Denotes Bottom

+XX.XXX Denotes finished ground level

Rev	Date	Description	DR	CH
C3	14/02/24	ISSUED FOR COMMENT	MK	JHC
C2	29/01/24	ISSUED FOR COMMENT	MK	JHC
C1	21/12/23	ISSUED FOR COMMENT	MK	JHC

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Email info@ggpconsult.co.uk

Client: acorn

Job Title: AD Plant. Three Maids

Drawing Title: Bund Details Wall–A Sheet–1

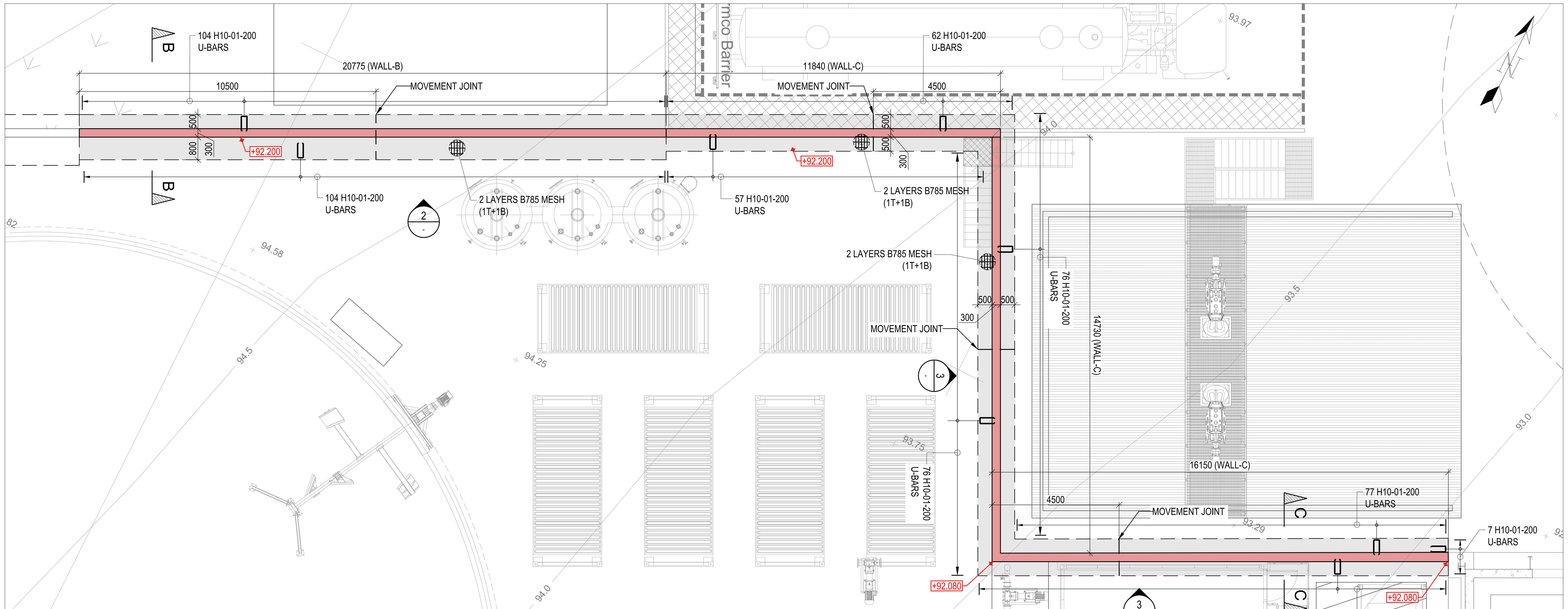
Status: For Comment

Scale: AS NOTED @ A1 | Date: DEC' '23

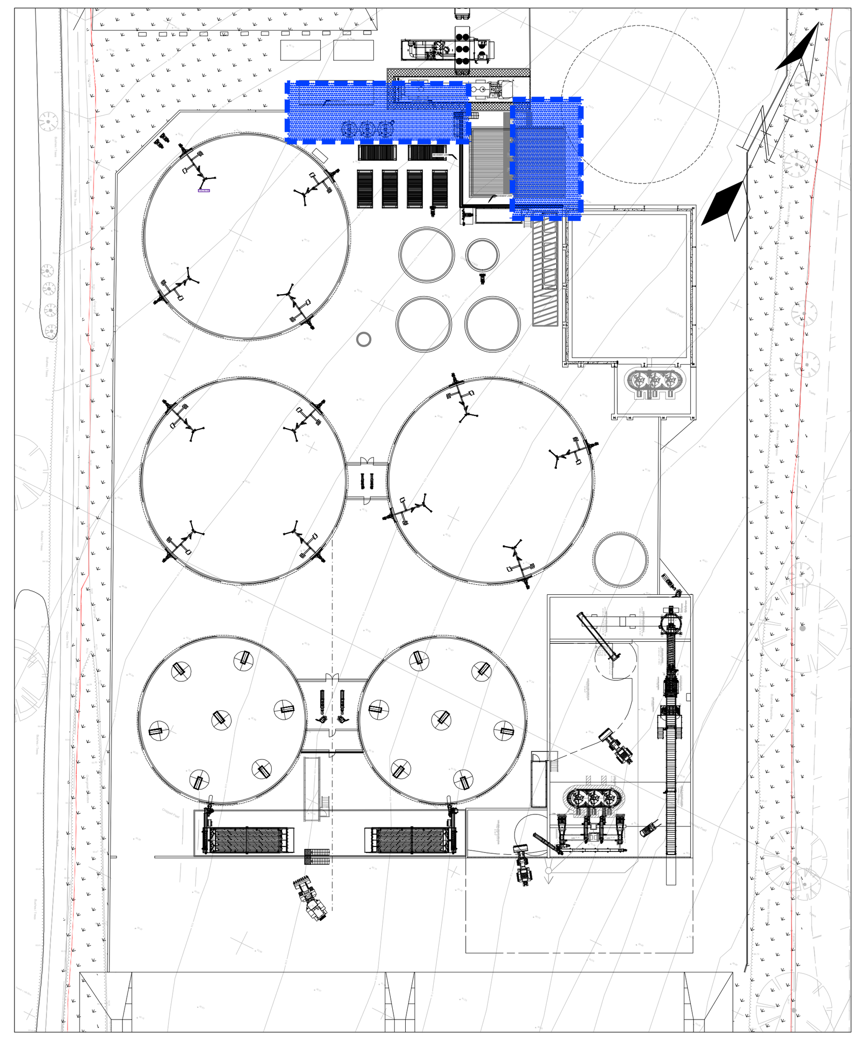
Drawn By: MK | Checked: JHC | Approved: JHC

Drg. No.: 29348/C/2020 | Rev: C3

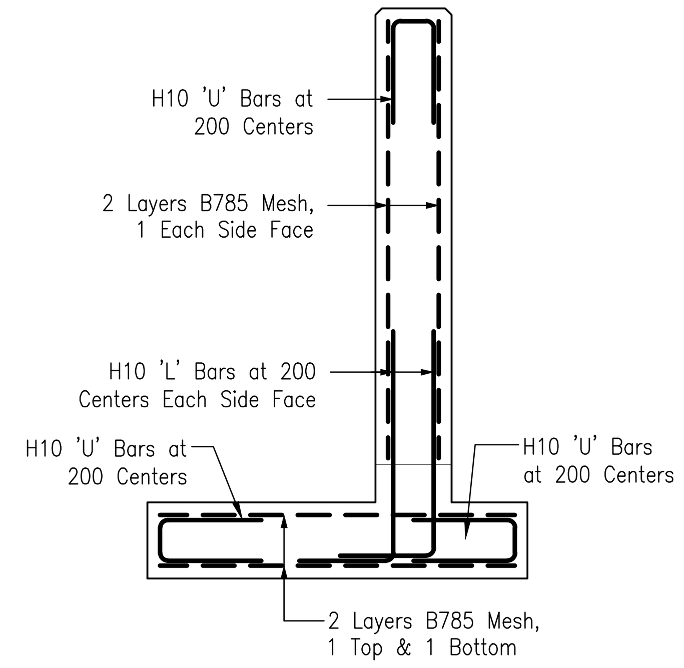
AS NOTED ON A1 FRAME



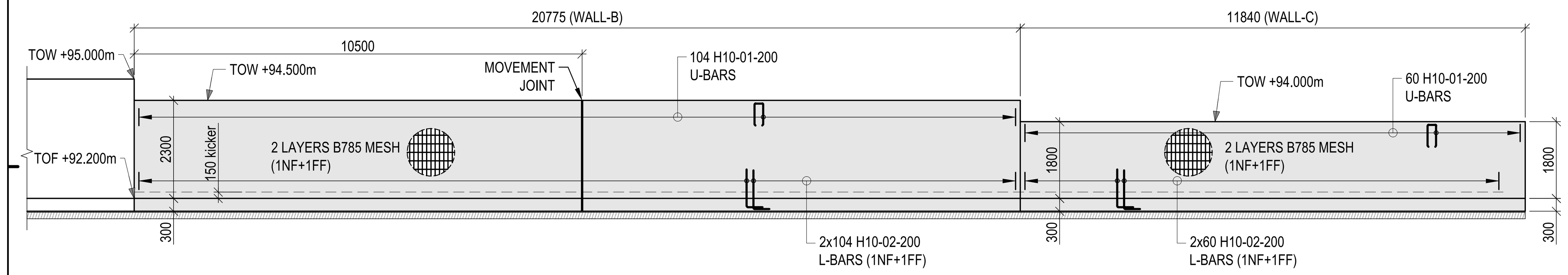
TANK BUND LAYOUT (WALL-B & C)
Scale: 1:100 @ A1



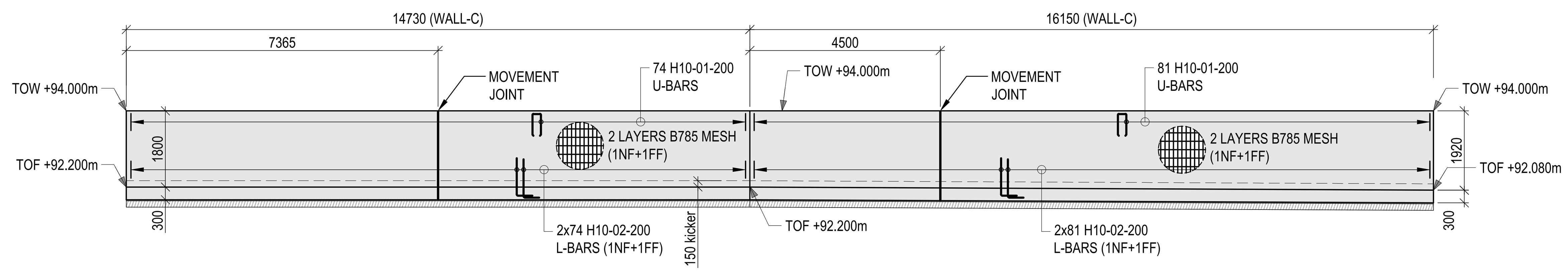
Key Plan
Scale: 1:1000 @ A1



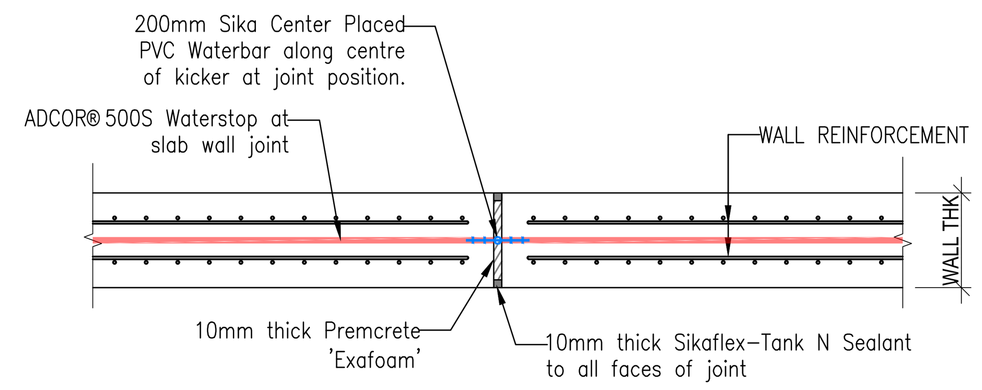
Typical Reinforcement Section
Thro Retaining Wall
Scale: N.T.S.



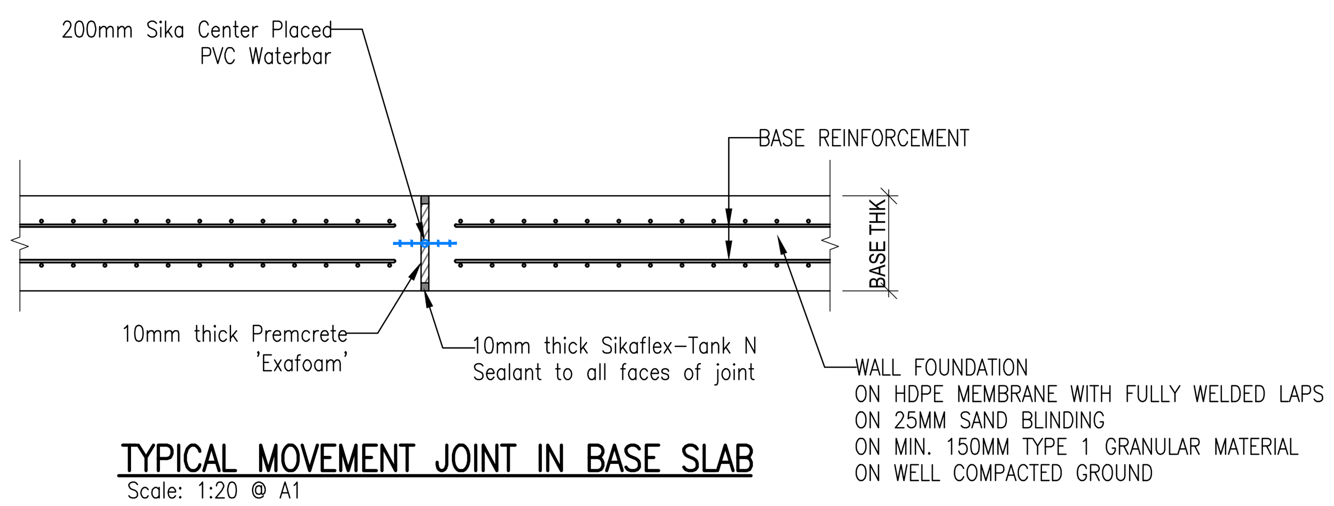
ELEVATION-2 (WALL-B & WALL-C)
Scale: 1:100 @ A1



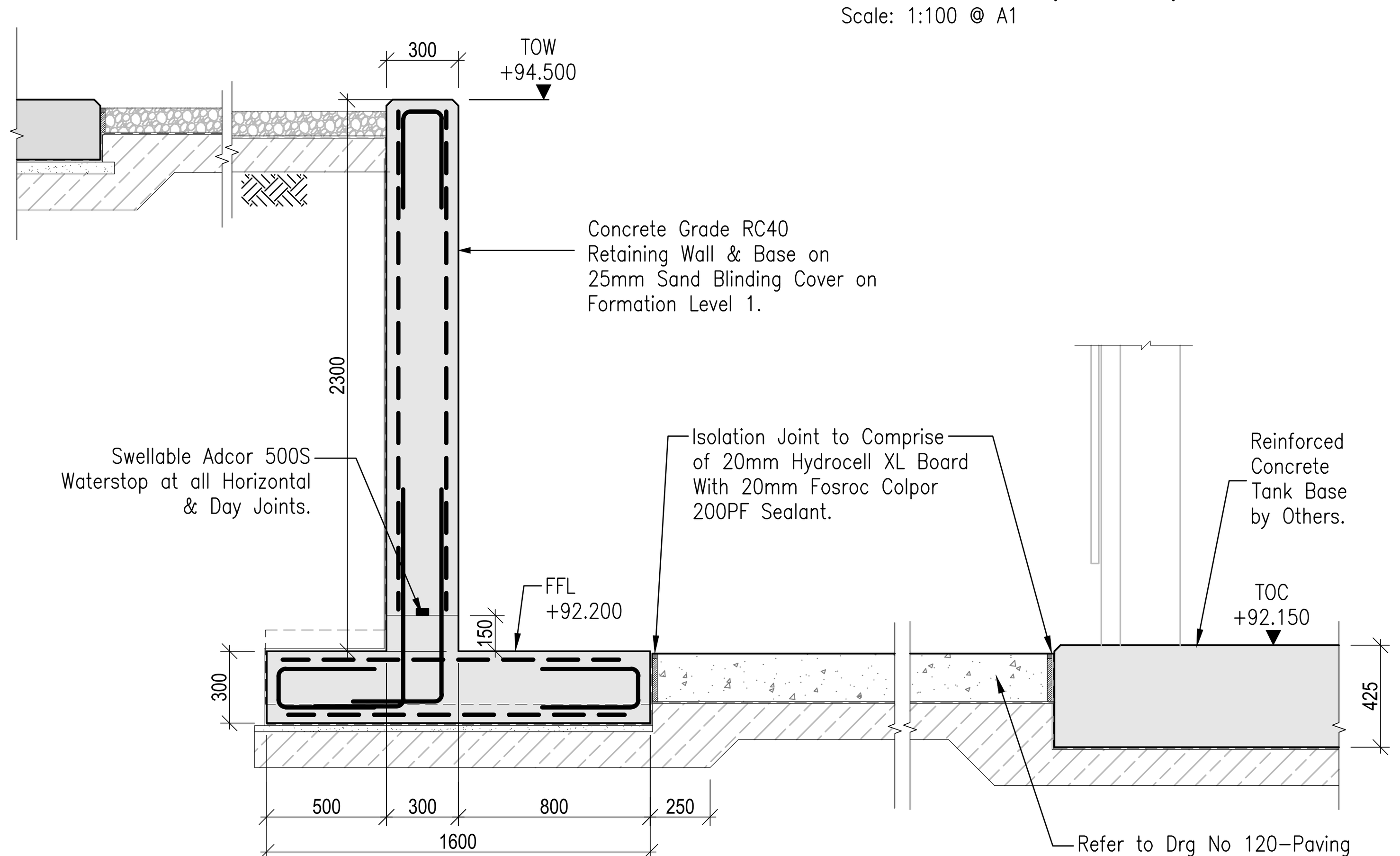
ELEVATION-3 (WALL-C)
Scale: 1:100 @ A1



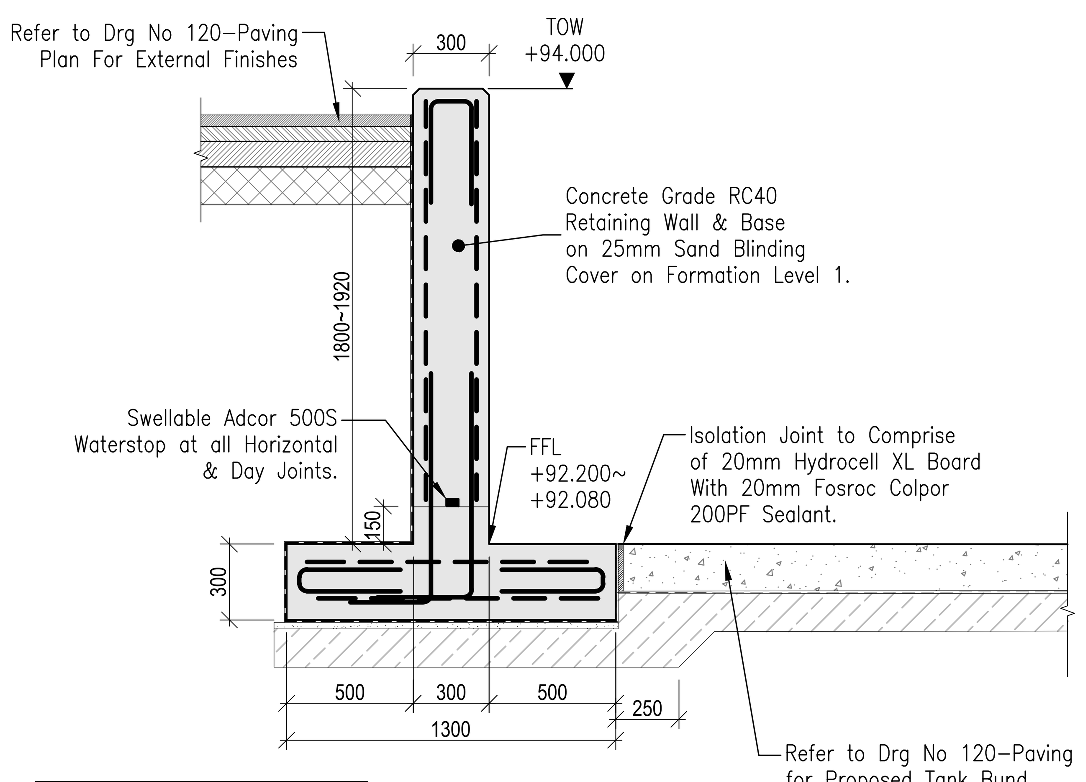
TYPICAL MOVEMENT JOINT IN WALLS
Scale: 1:20 @ A1



TYPICAL MOVEMENT JOINT IN BASE SLAB
Scale: 1:20 @ A1



SECTION B-B
Scale: 1:25 @ A1



* : Refer to Tank Bund Layout
for Finished levels.

SECTION C-C
Scale: 1:25 @ A1

FOR COMMENT

NOTES:-

1. All dimensions must be checked on site and not scaled from this drawing.
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.
5. When The Distance Between The Top Of Bund Wall & External Concrete/Ground Levels is Less Than 1.1m Provide Medium Duty Galvanised Steel Handrailing Fixed to The Top of the Wall. Height of Handrailing Varies to Suit Change in Concrete/Ground Levels.
6. Provide Movement Joints at 10m Centres Along Length of Wall in Accordance With Typical Contraction Joint Detail.
7. 25x25 Chamfer to all Exposed Edges

Site Red Line Boundary

T.O.W. : Denotes Top Of Wall
T.O.F. : Denotes Top Of Foundation
T.O.C. : Denotes Top Of Concrete
F.F.L. : Denotes Finished Level
G.L. : Denotes Ground Level

+xx.xxx Denotes finished ground level

Contractor to Allow For 75kg/m³ of Loose Bar Reinforcement Plus Mesh Reinforcement.

Rev	Date	Description	DR	CH
C2	29/01/24	ISSUED FOR COMMENT	MK	JHC
C1	21/12/23	ISSUED FOR COMMENT	MK	JHC

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Client
acorn

Job Title
AD Plant.
Three Maids

Drawing Title
Bund Details
Wall-B & Wall-C
Sheet-2

Status
For Comment

Scale
AS NOTED @ A1

Date
DEC' '23

Drawn By
MK

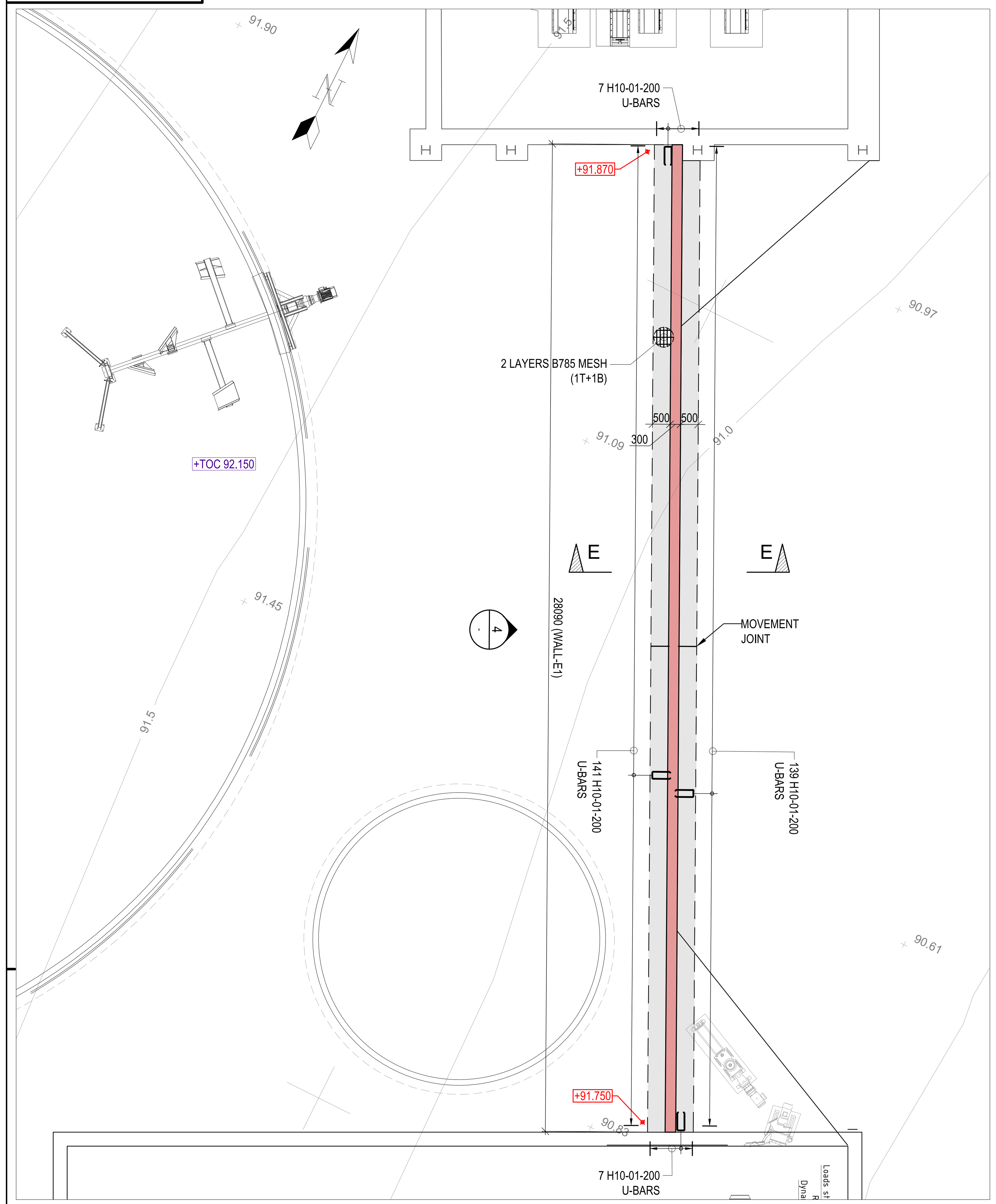
Checked
JHC

Approved
JHC

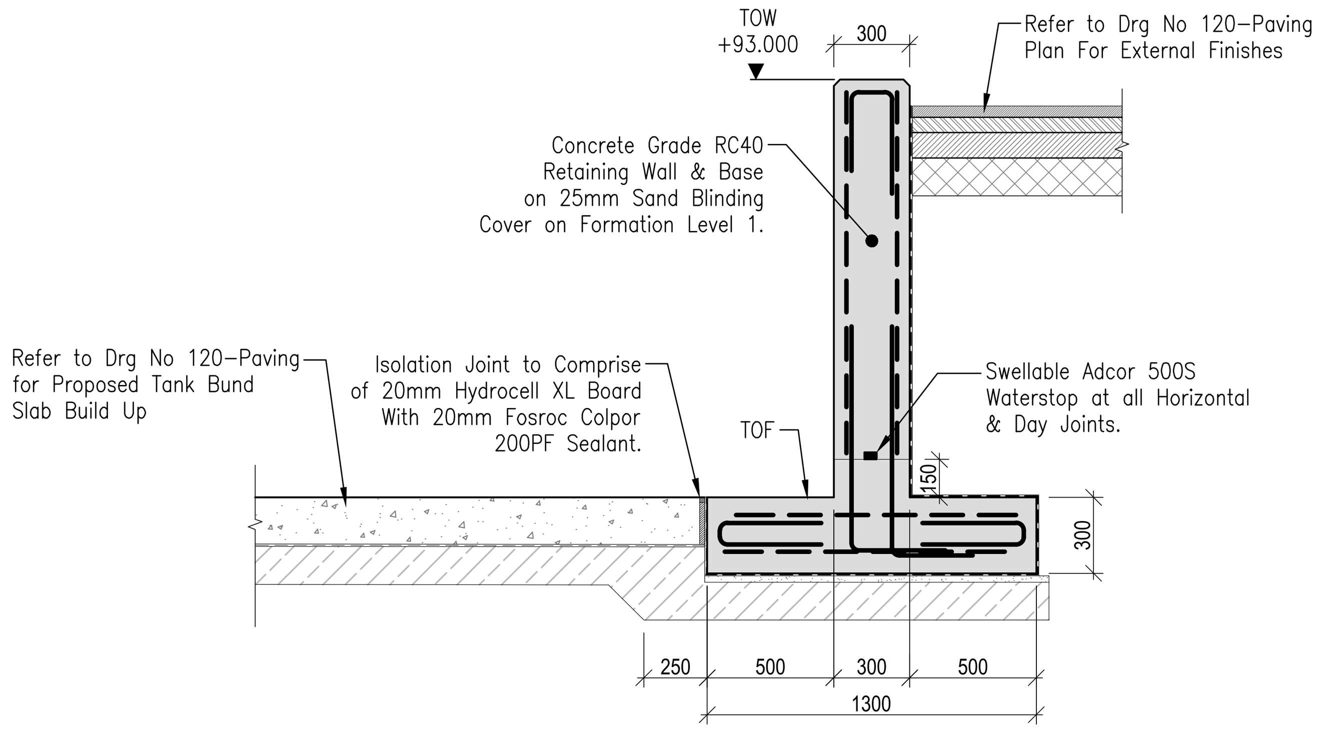
Drg. No.
29348/C/2020

Rev
C2

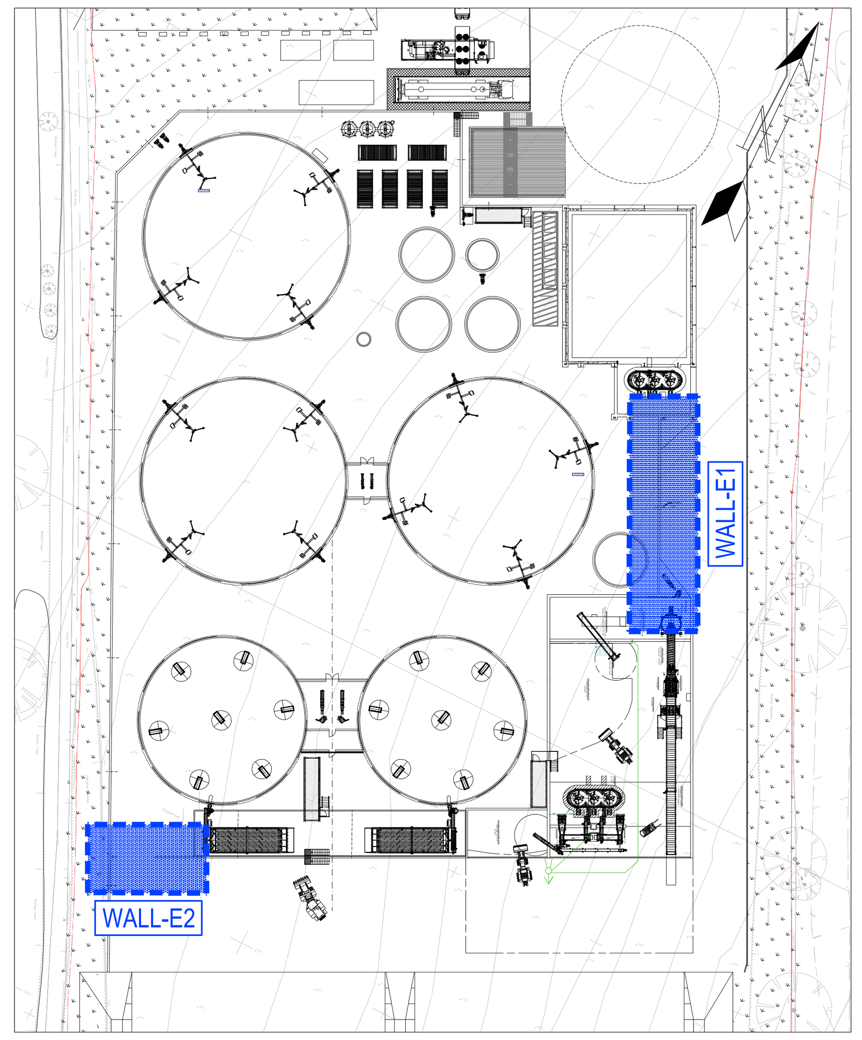
AS NOTED ON A1 FRAME



TANK BUND LAYOUT (WALL–E1)
Scale: 1:100 @ A1



SECTION E–E
Scale: 1:25 @ A1



Key Plan
Scale: 1:1000 @ A1

NOTES:-

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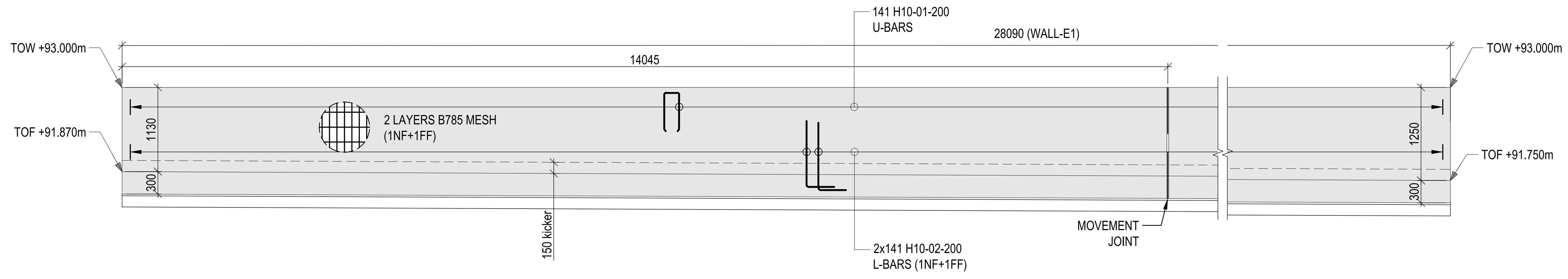
2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
3. All levels shown on this drawing are relative to Agreed Topographic survey
4. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.
5. When The Distance Between The Top Of Bund Wall & External Concrete/Ground Levels is Less Than 1.1m Provide Medium Duty Galvanised Steel Handrailing Fixed to The Top of the Wall. Height of Handrailing Varies to Suit Change in Concrete/Ground Levels.
6. Provide Movement Joints at 10m Centres Along Length of Wall in Accordance With Typical Contraction Joint Detail.
7. 25x25 Chamfer to all Exposed Edges

Site Red Line Boundary

T.O.W. : Denotes Top Of Wall
T.O.F. : Denotes Top Of Foundation
T.O.C. : Denotes Top Of Concrete
F.F.L. : Denotes Finished Level
G.L. : Denotes Ground Level

+xx.xxx Denotes finished ground level

<u>Contractor to Allow For 75kg/m³ of Loose Bar Reinforcement Plus Mesh Reinforcement.</u>



ELEVATION–4 (WALL–E1)
Scale: 1:50 @ A1

Rev	Date	Description	DR	CH
C2	29/01/24	ISSUED FOR COMMENT	MK	JHC
C1	21/12/23	ISSUED FOR COMMENT	MK	JHC

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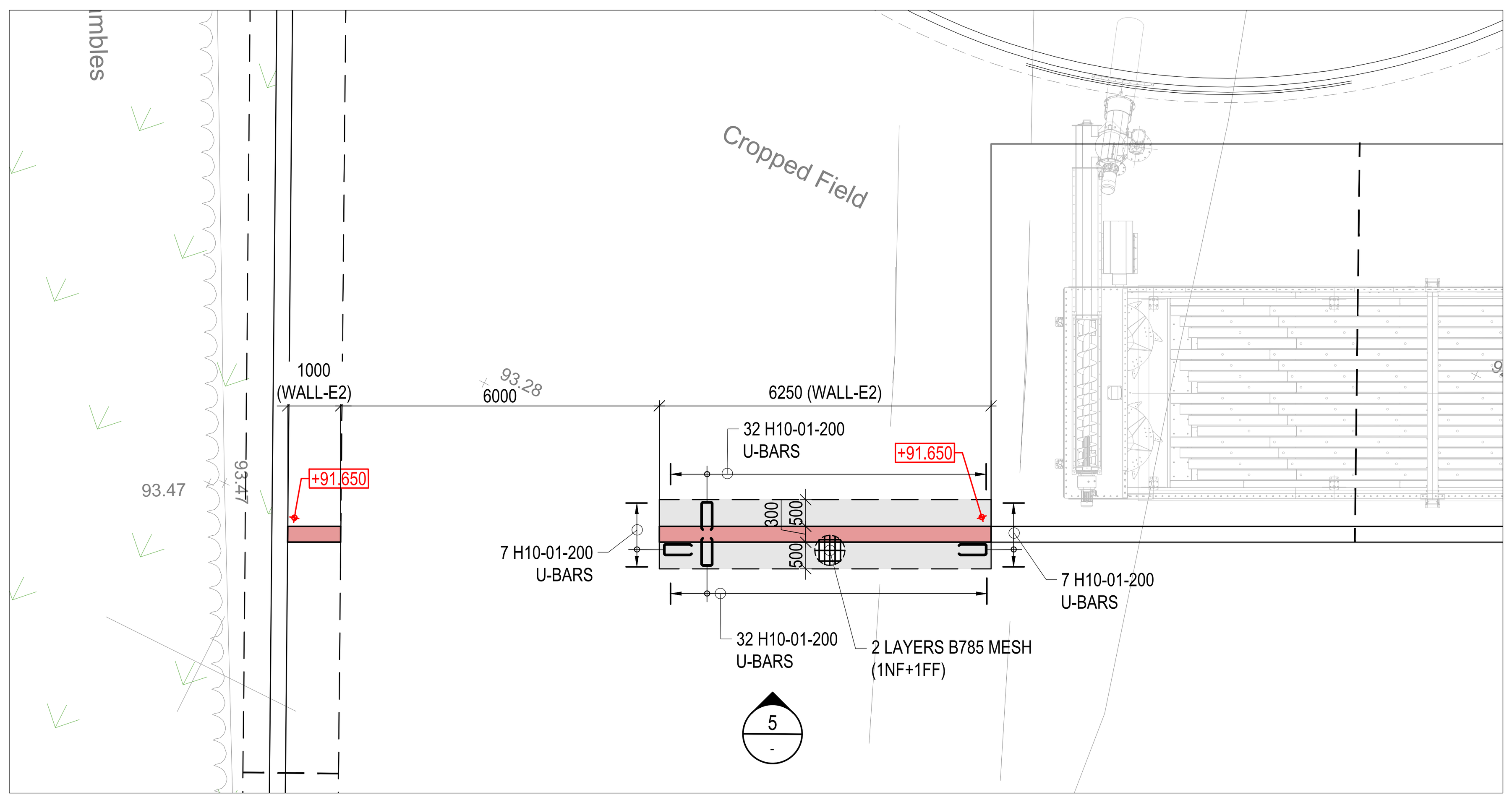
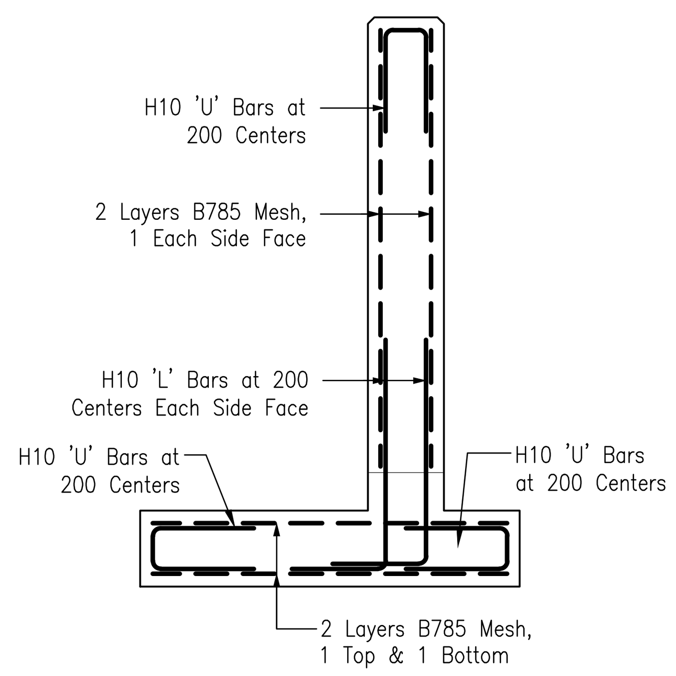
Fax (+44) 01482 641736
Email info@ggpconsult.co.uk

Client
acorn

Job Title
AD Plant.
Three Maids

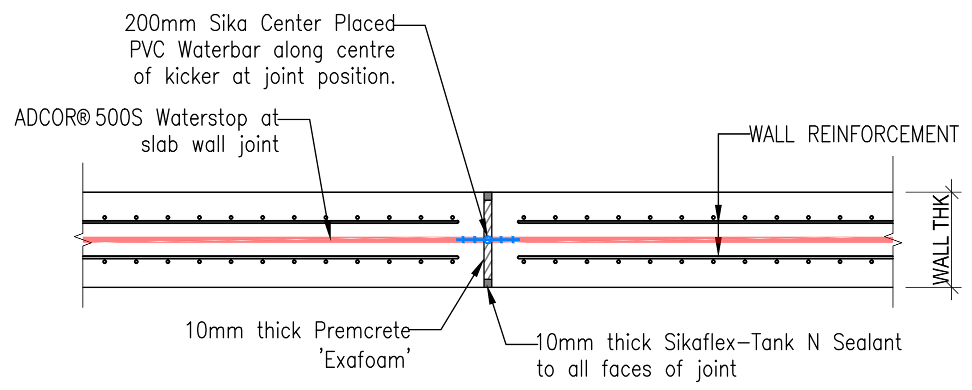


TANK BUND LAYOUT (WALL–E2)
Scale: 1:100 @ A1

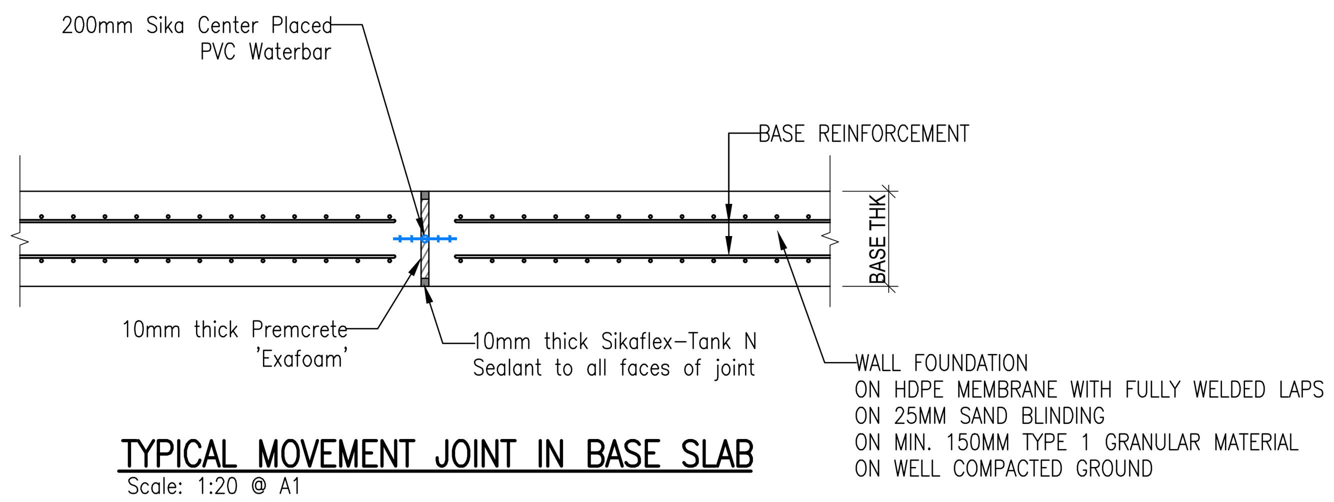


Typical Reinforcement Section
Thro Retaining Wall
Scale: N.T.S.

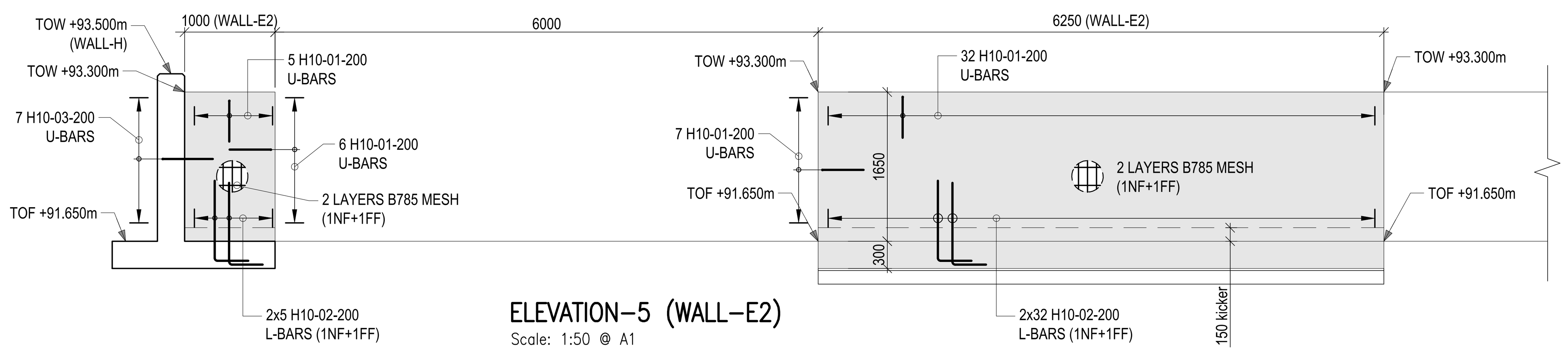
Drawing Title
Bund Details
Wall–E
Sheet–3



<u>TYPICAL MOVEMENT JOINT IN WALLS</u>
Scale: 1:20 @ A1



<u>TYPICAL MOVEMENT JOINT IN BASE SLAB</u>
Scale: 1:20 @ A1

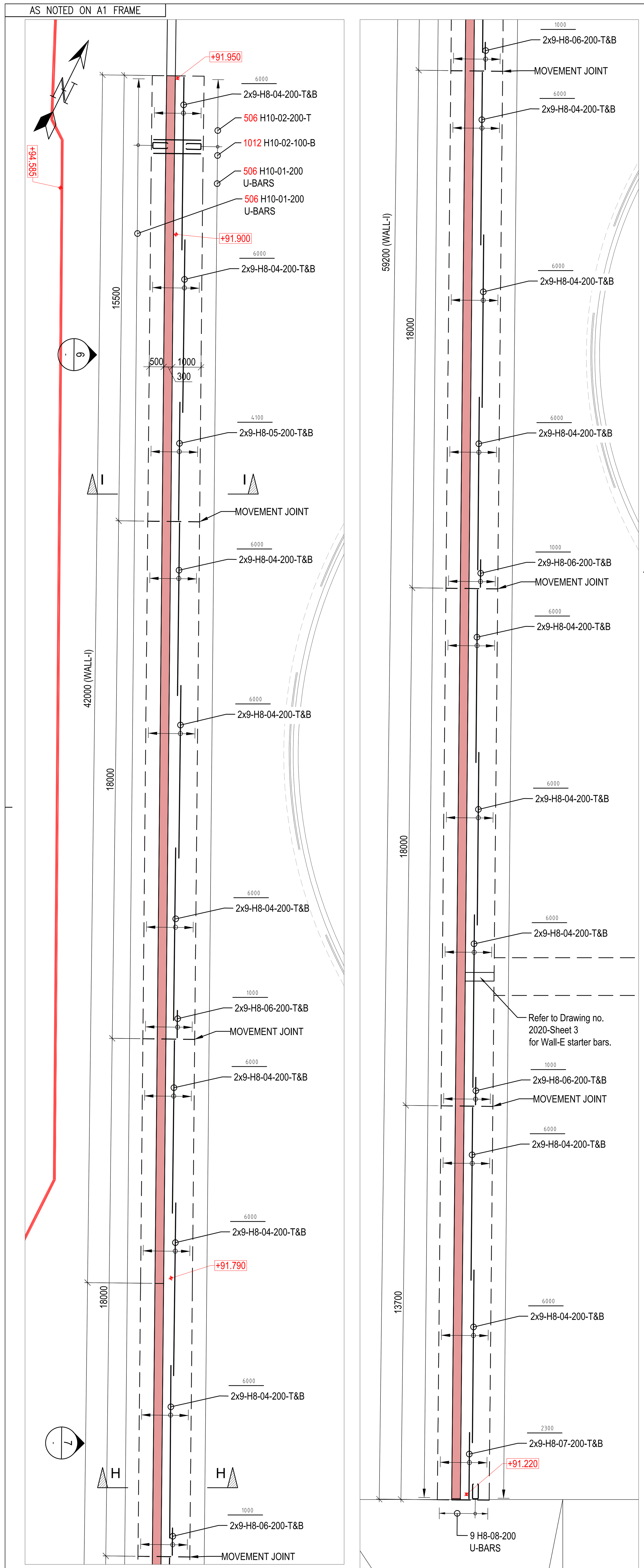


ELEVATION–5 (WALL–E2)
Scale: 1:50 @ A1

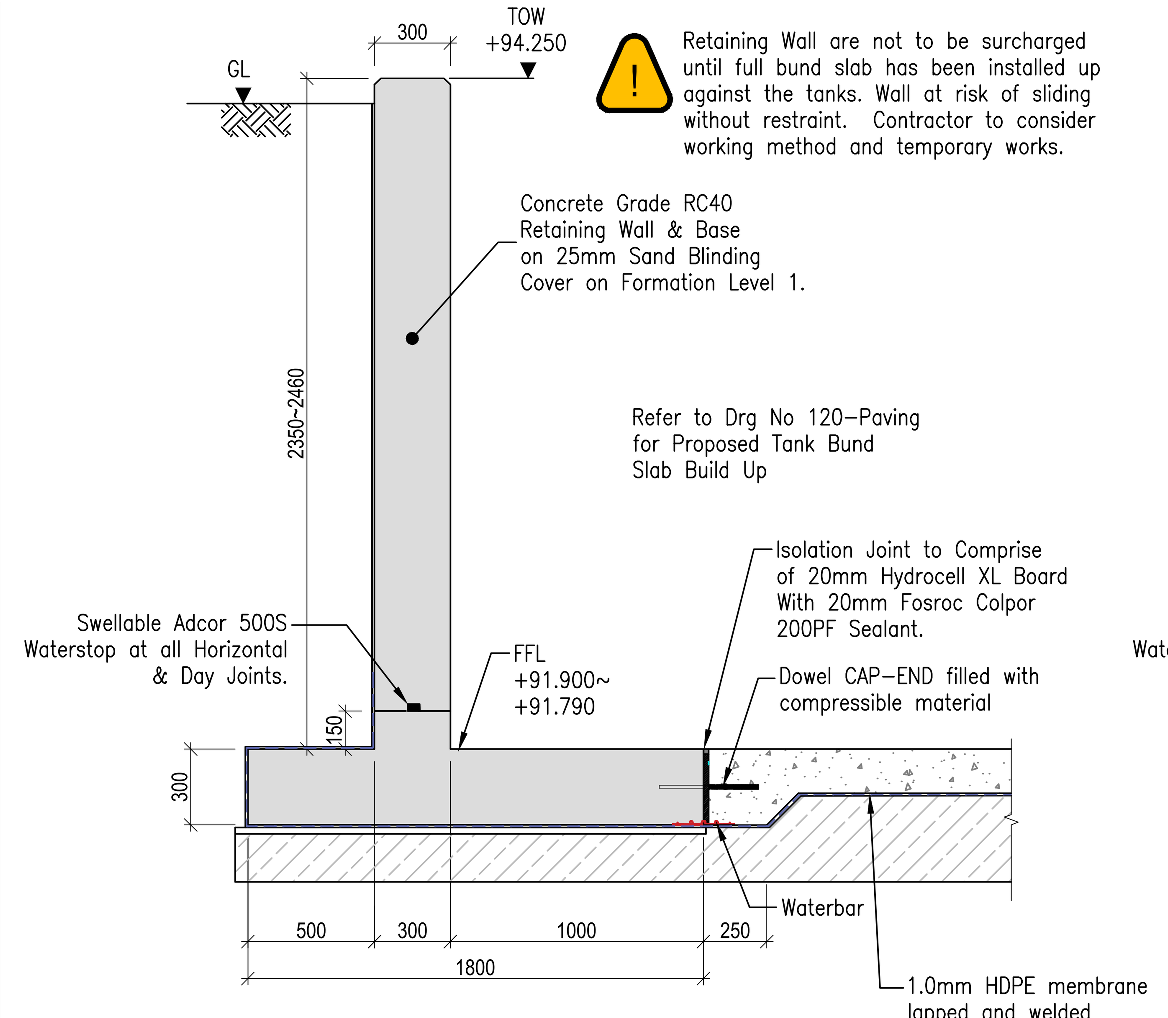
FOR COMMENT

Status		
For Comment		
Scale: AS NOTED @ A1	Date: DEC' '23	
Drawn By: MK	Checked: JHC	Approved: JHC
Drg. No.: 29348/C/2020	Rev: C2	

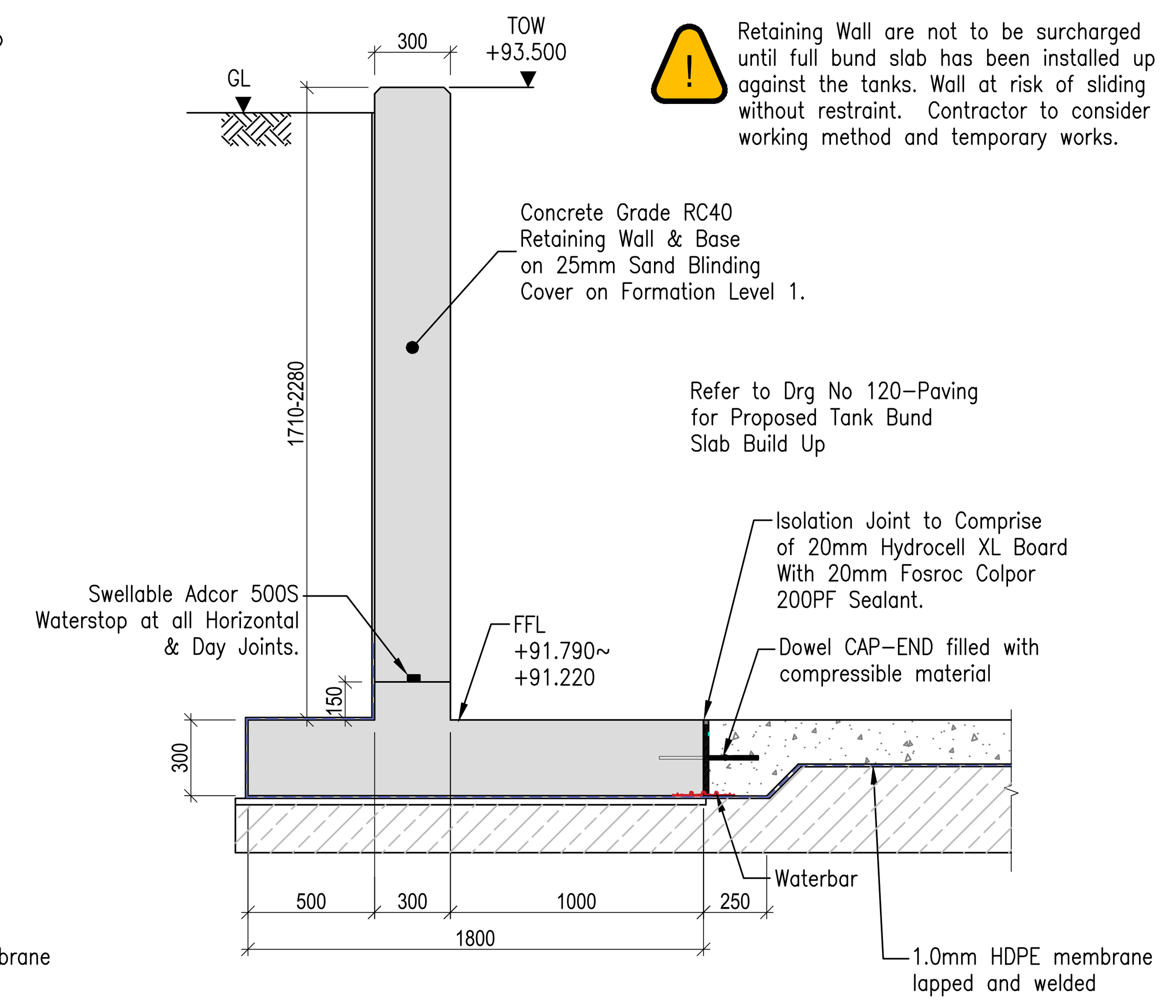
AS NOTED ON A1 FRAME



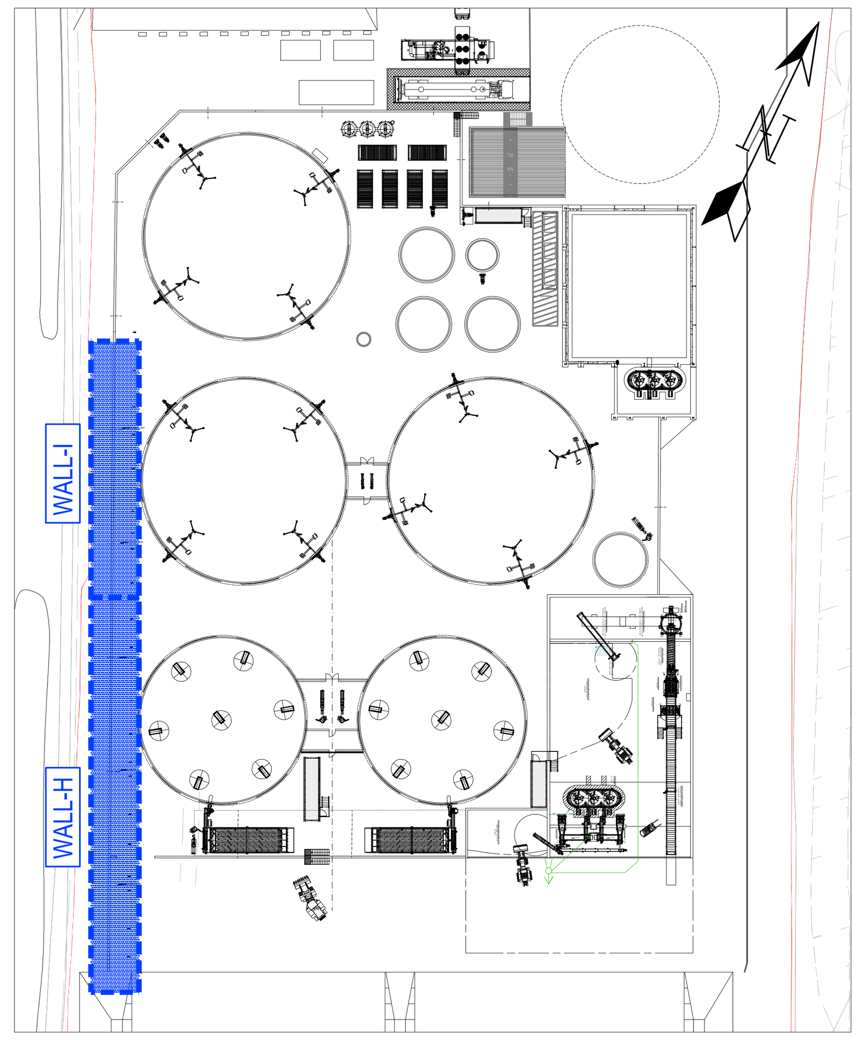
TANK BUND LAYOUT (WALLS H & I)
Scale: 1:100 @ A1



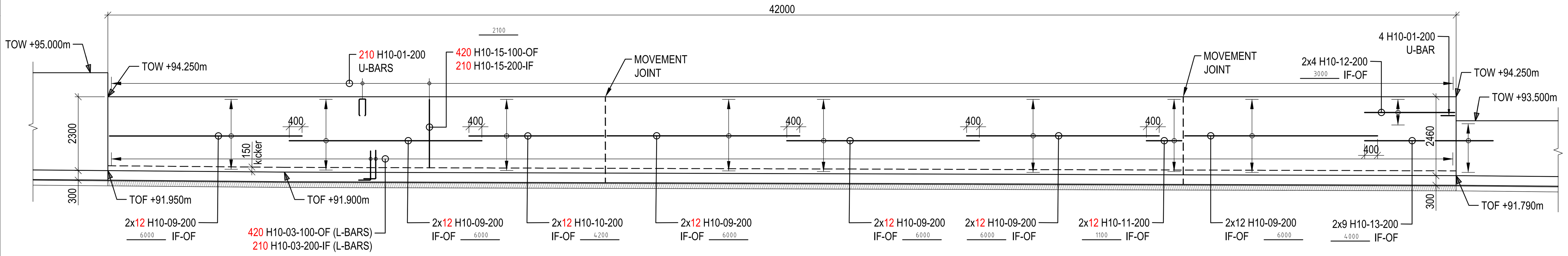
SECTION I-I
Scale: 1:25 @ A1



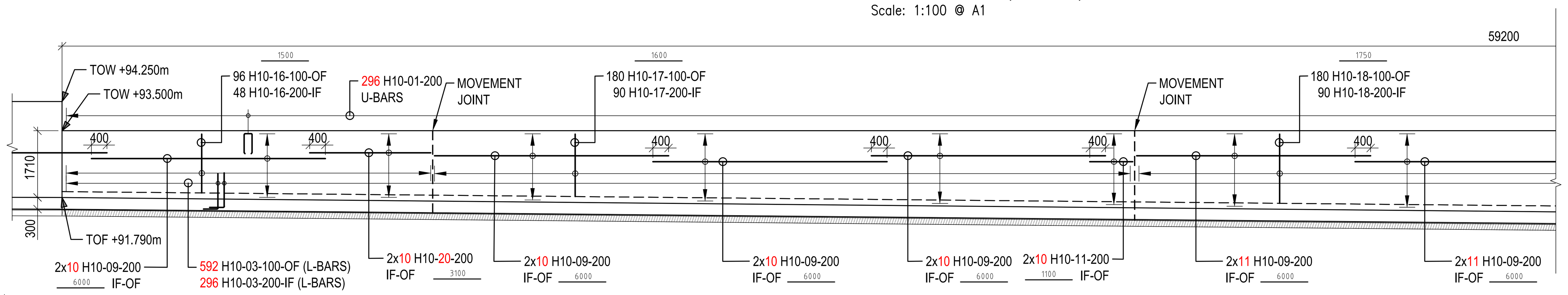
SECTION H-H
Scale: 1:25 @ A1



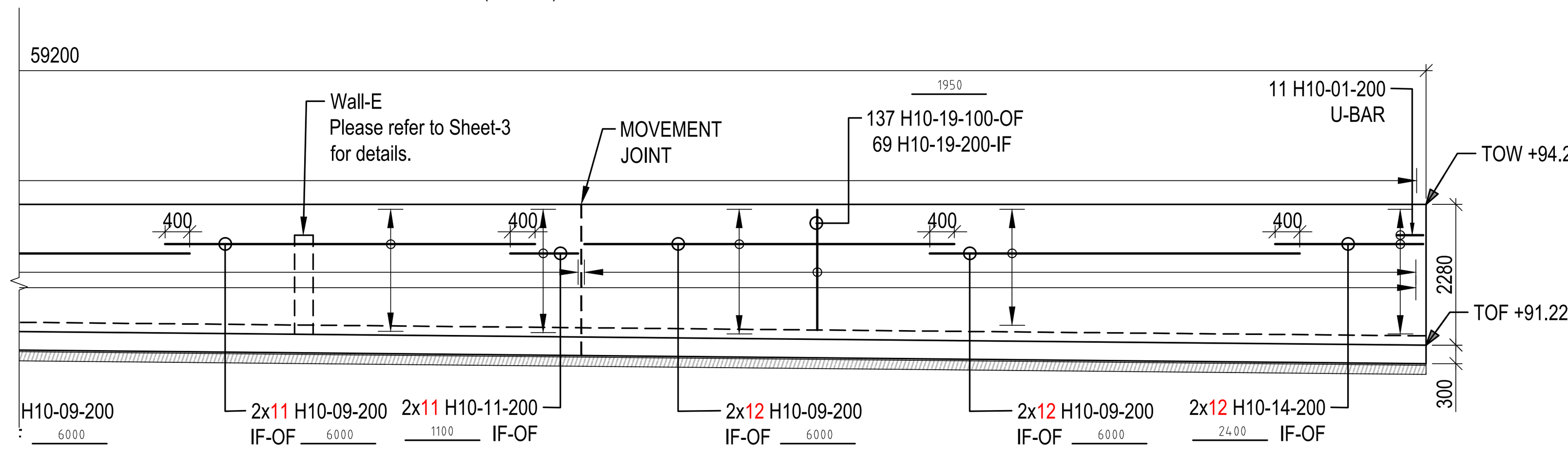
Key Plan
Scale: 1:1000 @ A1

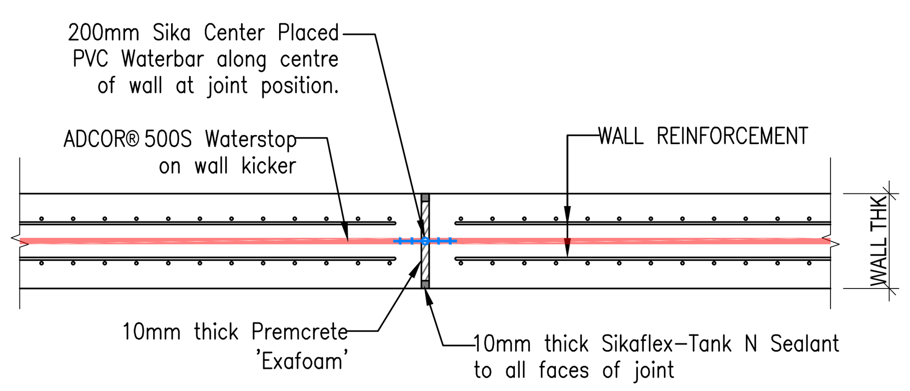


ELEVATION-6 (WALL-I)
Scale: 1:100 @ A1

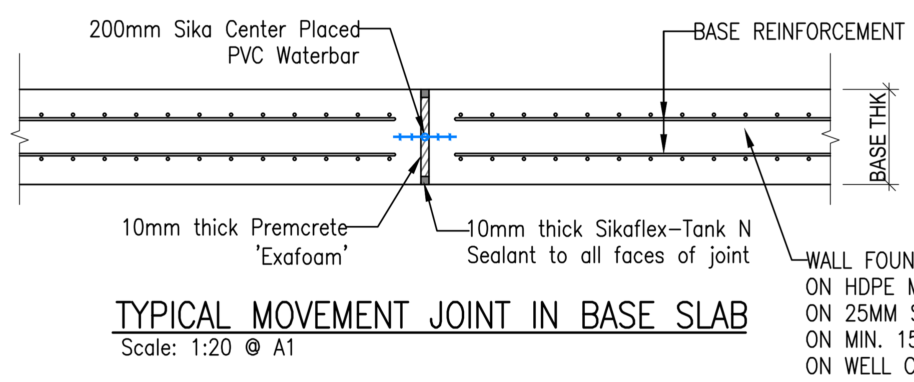


ELEVATION-7 (WALL-H)
Scale: 1:100 @ A1

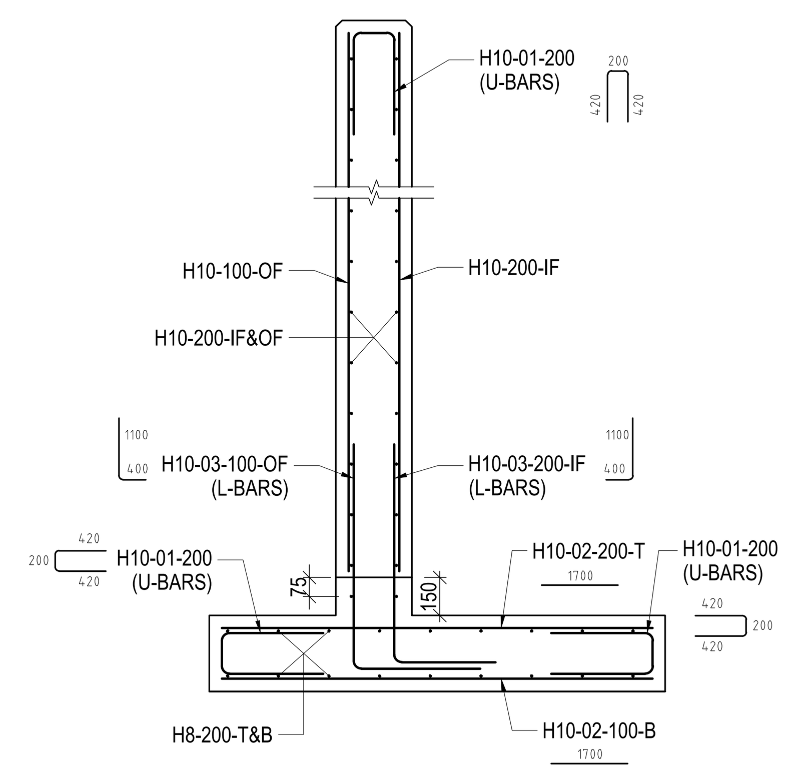




TYPICAL MOVEMENT JOINT IN WALLS
Scale: 1:20 @ A1



TYPICAL MOVEMENT JOINT IN BASE SLAB
Scale: 1:20 @ A1



Typical Reinforcement Section
Scale: 1:25 @ A1

FOR COMMENT

NOTES:-

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6. Provide Movement Joints at 18m Centres Along Length of Wall in Accordance With Typical Contraction Joint Detail.
7. 25x25 Chamfer to all Exposed Edges

Site Red Line Boundary

T.O.W. : Denotes Top Of Wall
T.O.F. : Denotes Top Of Foundation
T.O.C. : Denotes Top Of Concrete
F.F.L. : Denotes Finished Level
G.L. : Denotes Ground Level

+xx.xxx Denotes finished ground level

Rev	Date	Description	DR	CH
C4	15/02/24	ISSUED FOR COMMENT	MK	JHC
C3	14/02/24	ISSUED FOR COMMENT	MK	JHC
C2	29/01/24	ISSUED FOR COMMENT	MK	JHC
C1	21/12/23	ISSUED FOR COMMENT	MK	JHC

Constructionline
intertek
UKAS
Achilles UVDB SILVER PLUS
Audited RISQS
GGP CONSULT
CONSULTING ENGINEERS
ARCHITECTS
PROJECT MANAGEMENT
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Priory Park East
HULL HU4 7DY
United Kingdom
Telephone (+44) 01482 627963
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Email info@ggpconsult.co.uk

Client
acorn

Job Title
AD Plant. Three Maids

Drawing Title
Bund Details Wall-H & Wall-I Sheet-4

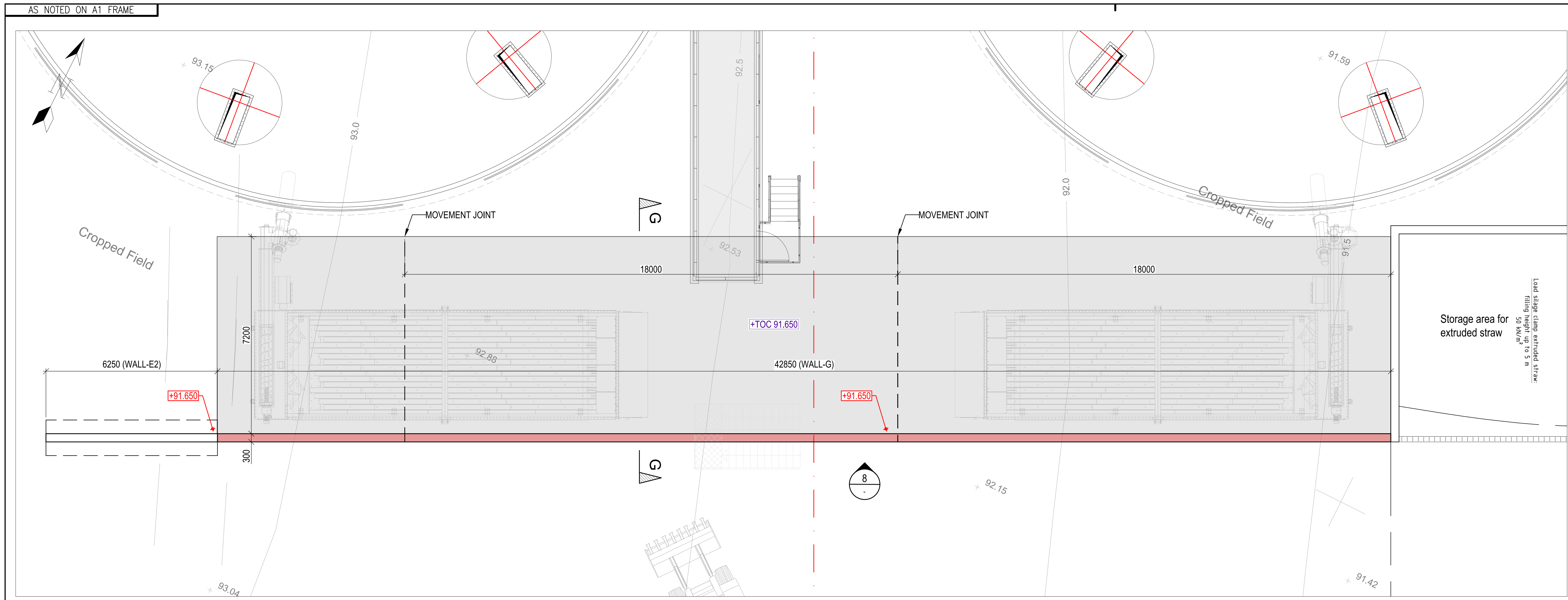
Status: For Comment

Scale: AS NOTED @ A1
Date: DEC' '23

Drawn By: MK
Checked: JHC
Approved: JHC

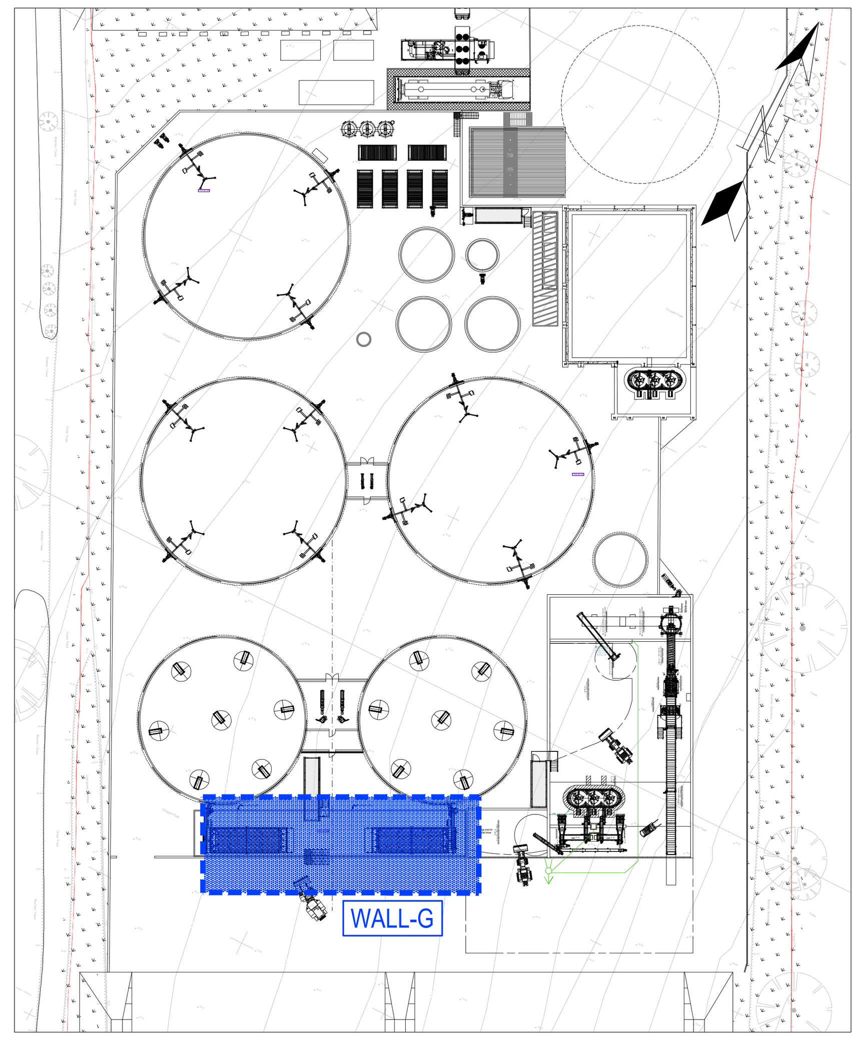
Drg. No.: 29348/C/2020
Rev: C4

AS NOTED ON A1 FRAME



TANK BUND LAYOUT (WALL–G)

Scale: 1:100 @ A1



Key Plan

Scale: 1:1000 @ A1

NOTES:-

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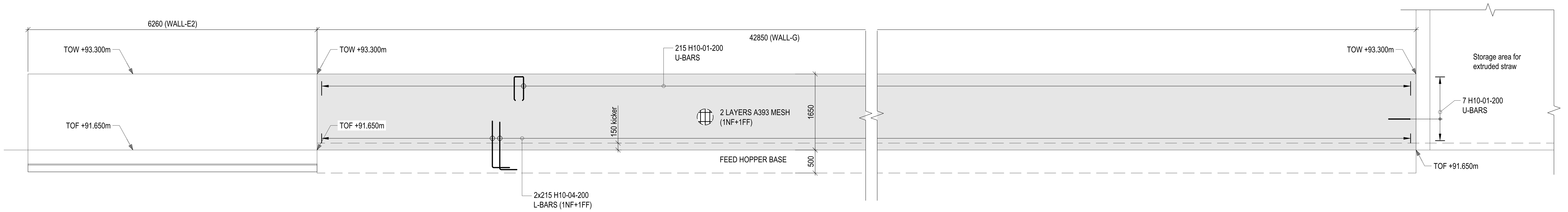
Site Red Line Boundary

T.O.W. : Denotes Top Of Wall
T.O.F. : Denotes Top Of Foundation
T.O.C. : Denotes Top Of Concrete
F.F.L. : Denotes Finished Level
G.L. : Denotes Ground Level

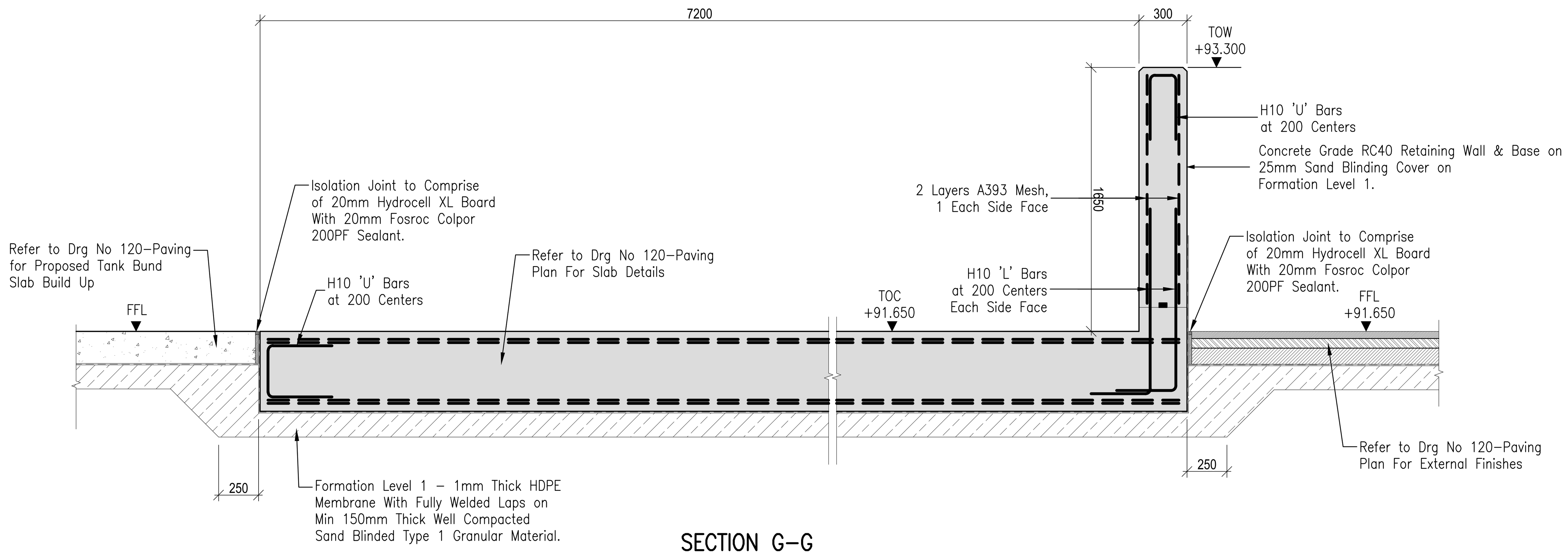
+xx.xxx Denotes finished ground level

Contractor to Allow For 75kg/m³ of Loose Bar Reinforcement Plus Mesh Reinforcement.



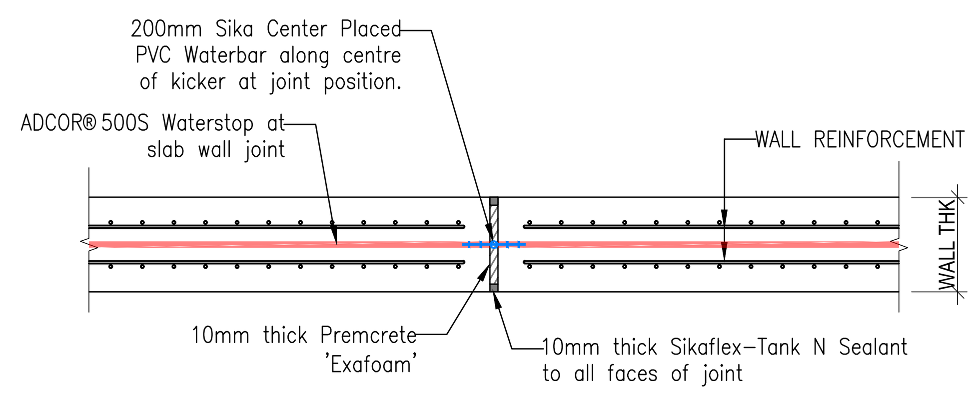
ELEVATION–8 (WALL–G)

Scale: 1:50 @ A1



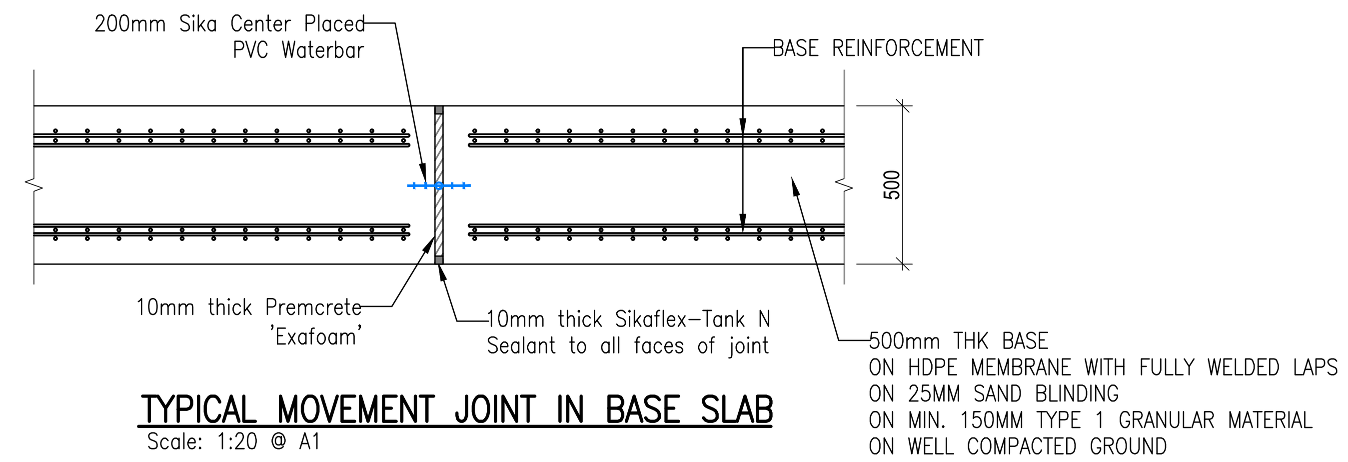
SECTION G–G

Scale: 1:25 @ A1



TYPICAL MOVEMENT JOINT IN WALLS

Scale: 1:20 @ A1



TYPICAL MOVEMENT JOINT IN BASE SLAB

Scale: 1:20 @ A1

FOR COMMENT

Rev	Date	Description	DR	CH
C2	29/01/24	ISSUED FOR COMMENT	MK	JHC
C1	21/12/23	ISSUED FOR COMMENT	MK	JHC

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Email info@ggpconsult.co.uk

Client: acorn

Job Title: AD Plant. Three Maids

Drawing Title: Bund Details Wall–G Sheet–5

Status: For Comment

Scale: AS NOTED @ A1 | Date: DEC' '23

Drawn By: MK | Checked: JHC | Approved: JHC

Drg. No.: 29348/C/2020 | Rev: C2

APPENDIX VI

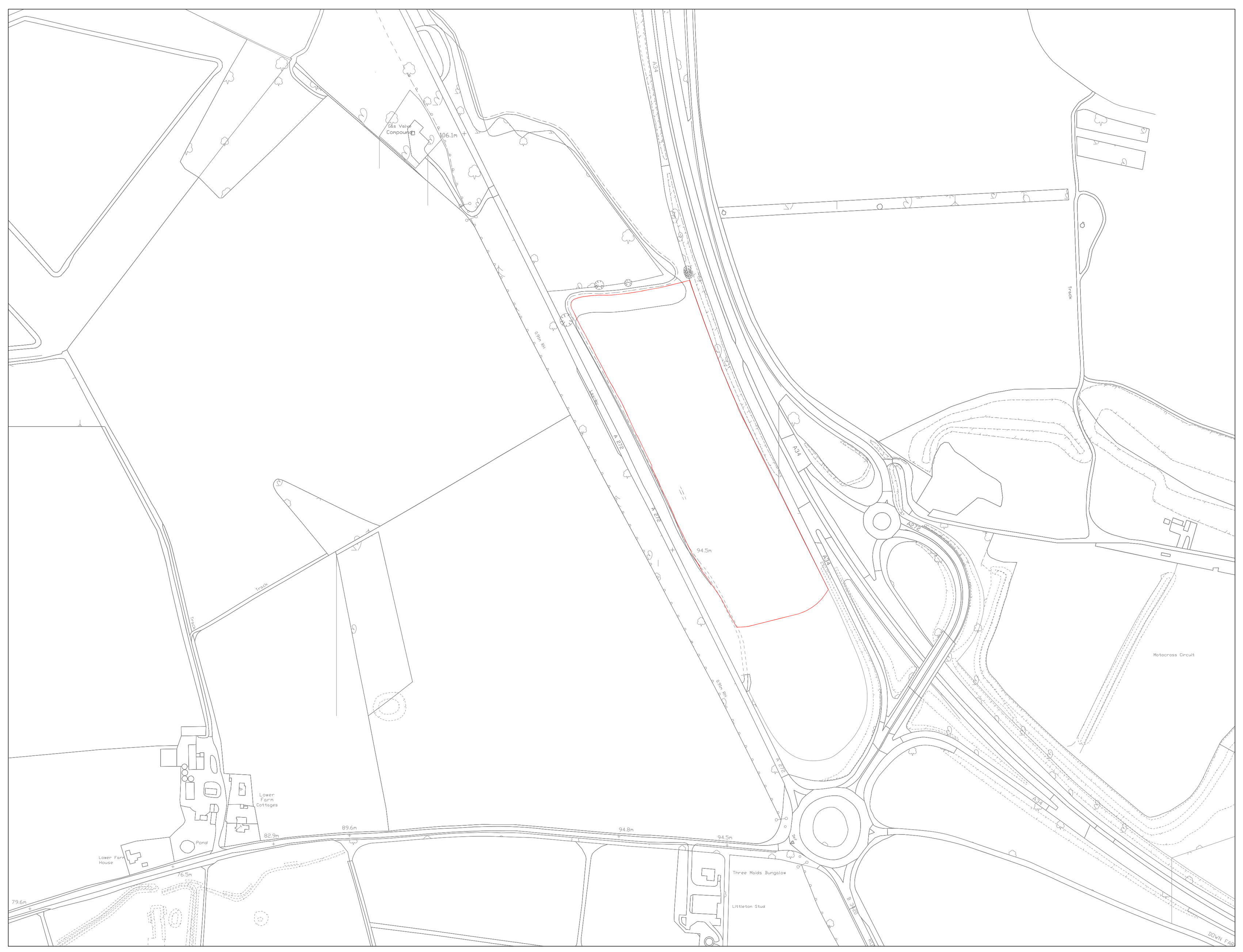
Drainage Details

AS NOTED ON A1 FRAME

N

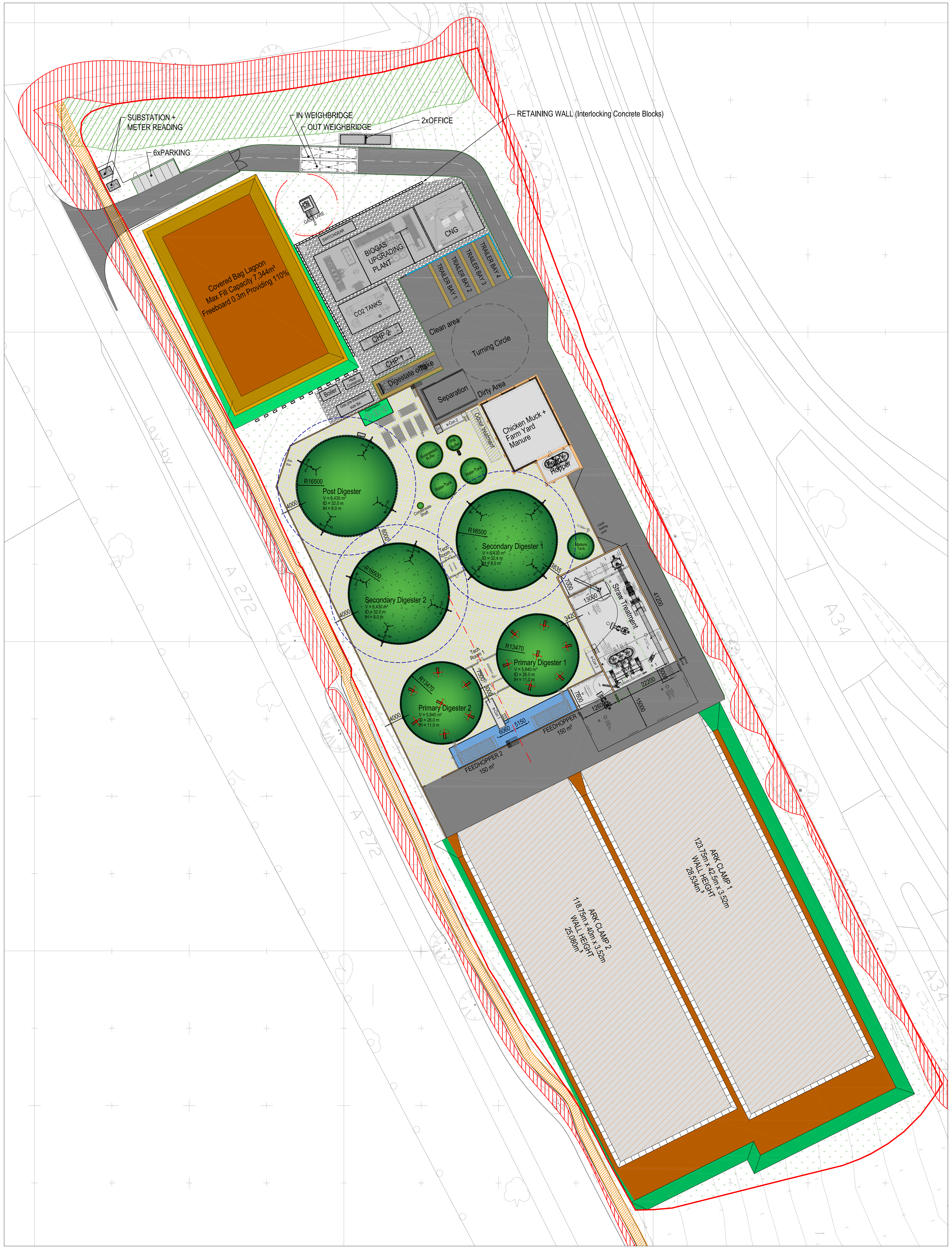
0 50m 100m 150m 200m 250m

Scale 1:5000 @ A1



SITE LOCATION PLAN

Scale: 1:5000 @ A1



SITE PLAN

Scale: 1:750 @ A1

FOR CONSTRUCTION

NOTES:-

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Site Red Line Boundary (4.453ha)

15m Woodland Easement

Tree Easement

Rev	Date	Description	DR	CH
C6	26/01/24	Tanking Layout amended	MK	JHC
C5	15/01/24	Odour moved	MK	JHC
C4	11/01/24	Switchgear updated to 40ft	MK	JHC
C3	11/01/24	Separation changed	MK	JHC
C2	18/12/23	ISSUED FOR CONSTRUCTION	MK	JHC
C1	08/12/23	ISSUED FOR CONSTRUCTION	MK	JHC

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Email info@ggpconsult.co.uk

Client: acorn

Job Title: AD Plant. Three Maids

Drawing Title: Site Layout Plan

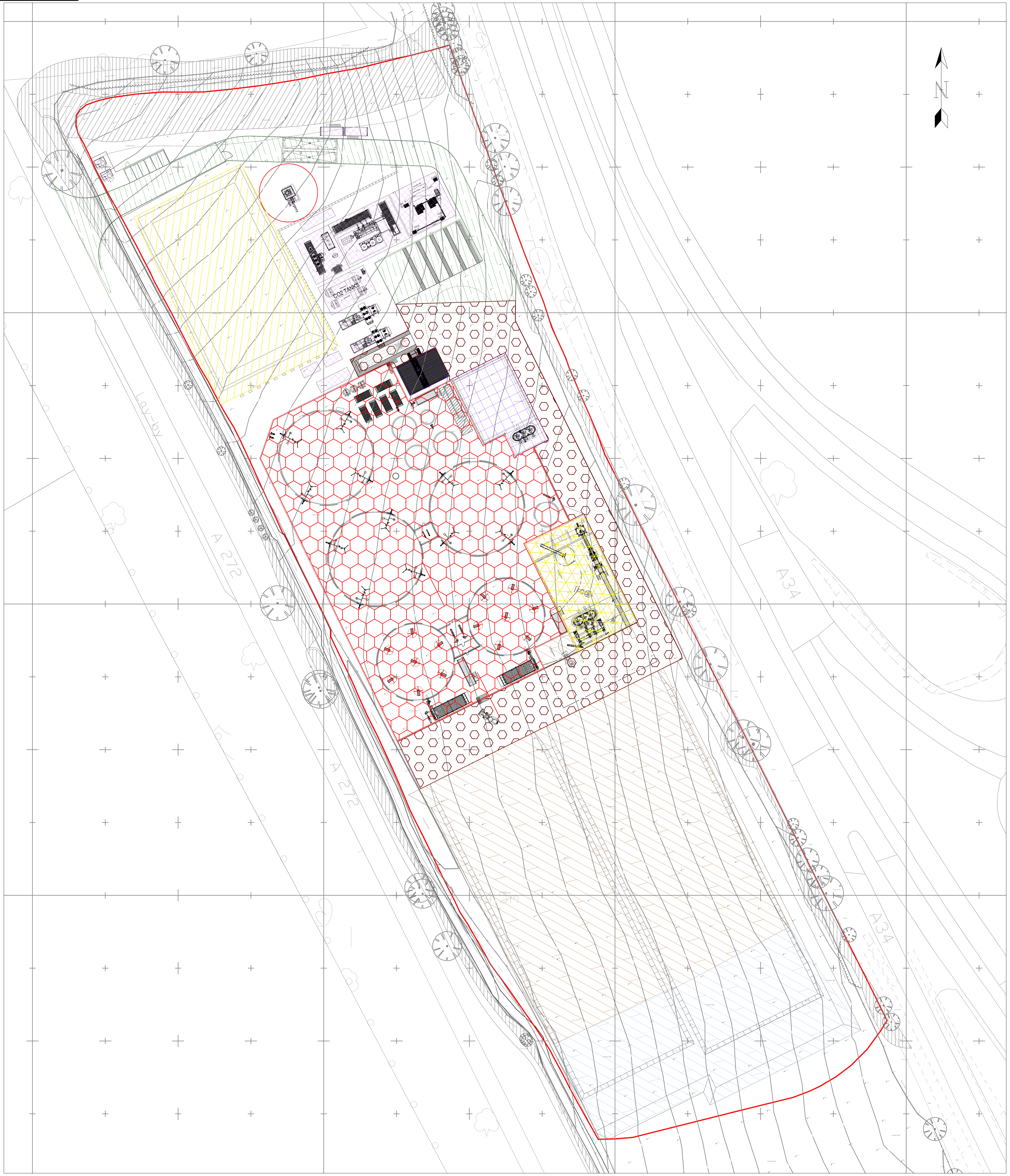
Status: For Construction

Scale: AS NOTED @ A1 | Date: DEC' '23

Drawn By: MK | Checked: JHC | Approved: JHC

Drg. No.: 29348/C/101 | Rev: C6

AS NOTED ON A1 FRAME



SITE PLAN

Scale: 1:750 @ A1

NOTES:-

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5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

- Site Red Line Boundary
- Denotes Digestate Lagoon Area – 3,042m^2
- Denotes Clean w/Petrochemicals Hardstanding Runoff Area – 2,461m^2
- Denotes Clean Equipment Runoff Area – 1,457m^2
- Denotes Clean/Contaminated Bund Runoff Area – 8,323m^2
- Denotes Dirty Silage Clamp Runoff Area – 9,220m^2
- Denotes Contaminated Hardstanding Runoff Area – 3,745m^2
- Denotes Clean Roof Runoff Area – 804m^2
- Denotes Clean Silage Clamp Cover Runoff Area – 3,696m^2
- Denotes Clean Runoff Straw Building – 956m^2

Rev	Date	Description	DR	CH
EA1	26/02/24	EA PERMIT	WG	JHC

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Email info@ggpconsult.co.uk

Client: acorn

Job Title: AD Plant. Three Maids

Drawing Title: Drainage Catchment Plan

Status: EA PERMIT

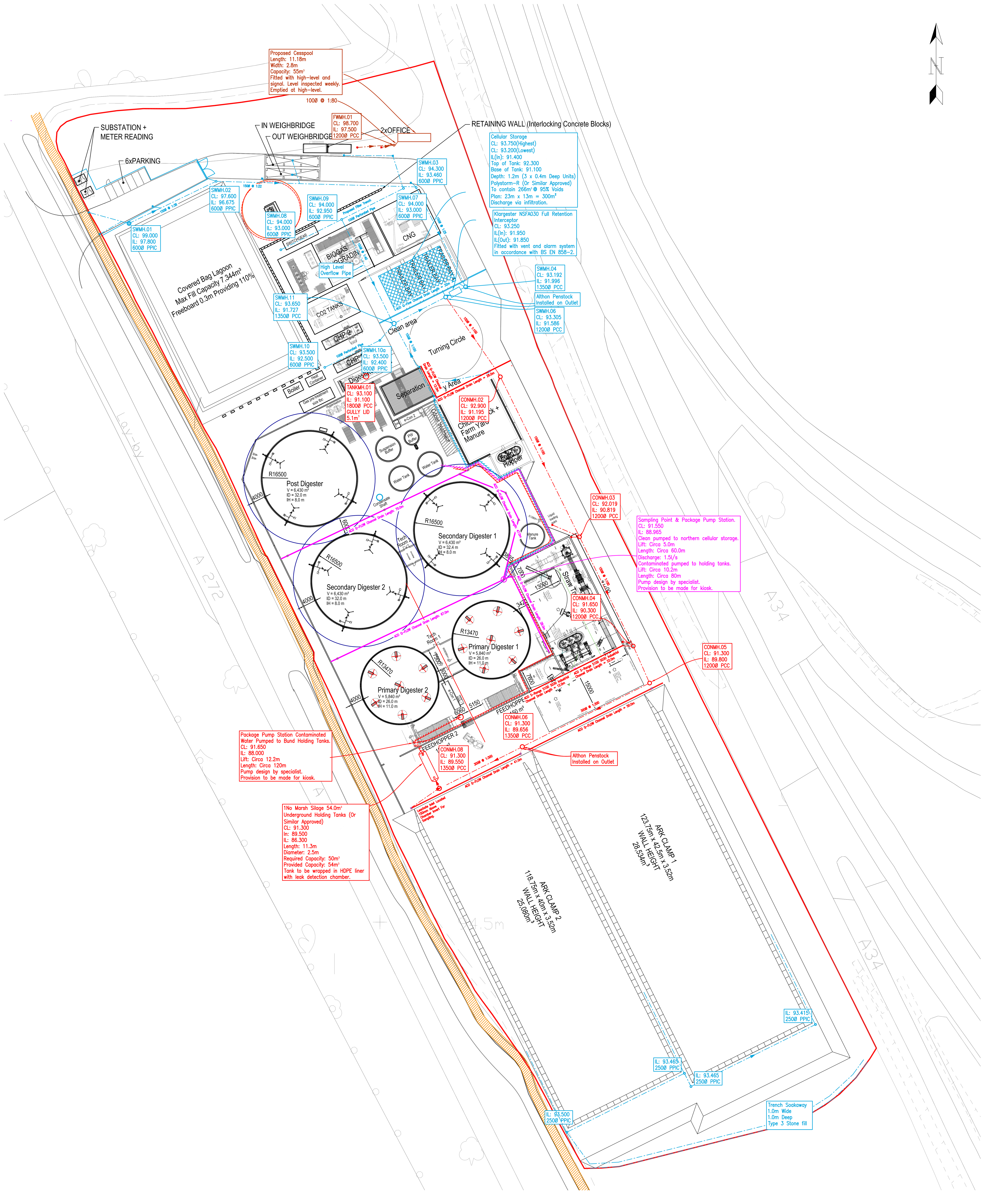
Scale: AS NOTED @ A1 | Date: DEC' '23

Drawn By: WG | Checked: JHC | Approved: JHC

Drg. No.: 29348/C/103 | Rev: EA1

FOR EA PERMIT

DRAWN AT 1:1 ON A1 FRAME



SITE PLAN

Scale: 1:750 @ A1

FOR EA PERMIT

NOTES:-

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2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
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4. This drawing is to be read in conjunction with 29348/100 Series Drawings.
5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

- Site Red Line Boundary
- Clean Surface Water Sewer
- Clean Surface Water Chamber
- Clean Surface Water Headwall
- Clean Surface Water Drainage Channel
- Clean Surface Water Rainwater Pipe
- Clean Surface Water Rising Main
- Contaminated Surface Water Sewer
- Contaminated Surface Water Chamber
- Contaminated Surface Water Drainage Channel
- Contaminated Surface Water Rising Main
- Bund Surface Water Sewer
- Bund Surface Water Chamber
- Bund Surface Water Channel Drain
- Foul Water Sewer
- Foul Water Chamber
- Soil Vent Pipe

All pipes to be encased in concrete.

All Clean manholes to be double sealed

Rev	Date	Description	DR	CH
EA1	26/02/24	ISSUED FOR COMMENT	WG	JHC

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Email info@ggpconsult.co.uk

Client

acorn BIOENERGY

Job Title

AD Plant.
Three Maids

Drawing Title

Proposed Drainage Layout

Status: EA Permit

Scale: 1:750 @ A0

Date: DEC' '23

Drawn By: W.GRANT

Checked: JHC

Approved: JHC

Drg. No. 29348/C/110

Rev EA1