Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6765/2022/1
Works approval holder	Northern Star (Thunderbox) Pty Ltd
ACN	107 154 727
Registered business address	Level 1, 388 Hay Street SUBIACO 6008
DWER file number	DER2022/000692
Duration	21/03/2023 to 20/03/2028
Date of issue	21 March 2023
Premises details	Thunderbox Mining Operations Mining tenements M36/504 & M36/512

Prescribed premises category description (Schedule 1, ***Environmental Protection Regulations 1987***)	**Assessed production / design capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore	3,000,000 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 21 March 2023, by:

Lauren Edmands

Digitally signed by Lauren Edmands
Date: 2023.03.21 13:42:43 +08'00'

MANAGER, RESOURCE INDUSTRIES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
21/03/2023	W6765/2022/1	Works approval granted

Interpretation

In this works approval:

(a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this works approval:

(i) if dated, refers to that particular version; and

(ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

General

1. The works approval holder must manage dust generation at the premises by wetting down activities associated with the construction of the tailings storage facility embankment lifts.

Construction phase

Infrastructure and equipment

2. The works approval holder must:

(a) construct all critical containment infrastructure;

(b) in accordance with the corresponding design and construction requirements; and

(c) at the corresponding infrastructure location;

as set out in Table 1.

Table 1 Critical containment infrastructure design and construction requirements

Item number	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	Tailings storage facility: construction stage 9, cell B	(a) Cell B embankment lift 511.4 m RL constructed as per specifications within Figure 3 and Figure 4 of Schedule 1; (b) Decant tower raise as per specifications within Figure 5 of Schedule 1; and (c) Eastern toe drain tower raise as per specifications within Figure 5 of Schedule 1.	TSF cell B as shown in Figure 2 of Schedule 1.
2.	Tailings storage facility: construction stage 10, cell B	(a) Cell B embankment lift to 514.6 m RL constructed as per specifications within Figure 7 of Schedule 1; (b) Decant tower raise as per specifications within Figure 9 and Figure 10 of Schedule 1; (c) Eastern toe drain tower raise as per specifications within Figure 10 of Schedule 1; (d) Underdrainage tower raise as per specifications within Figure 11 of Schedule 1; and (e) Installation of nine new piezometers to replace decommissioned piezometers from stage 9. Location and specifications as per Figure 12 and Figure 13 of Schedule 1	TSF cell B as shown in Figure 6 and Figure 8 of Schedule 1.

Item number	Infrastructure	Design and construction / installation requirements	Infrastructure location
3.	Tailings storage facility construction stage 11, cell A	(a) Cell A embankment lift to 516.7 m RL constructed as per specifications within Figure 7 of Schedule 1; (b) Decant tower raise as per specifications within Figure 9 and Figure 10 of Schedule 1; (c) Eastern toe drain tower raise as per specifications within Figure 10 of Schedule 1; (d) Underdrainage tower raise as per specifications within Figure 11 of Schedule 1; and (e) Installation of nine new piezometers to replace decommissioned piezometers from stage 10 (if not already installed as part another). Locations and specifications as Figure 12 and Figure 13 of Schedule 1	TSF cell A as shown in Figure 6 and Figure 8 of Schedule 1.
4.	Tailings storage facility construction stage 11, cell B	(a) Cell B embankment lift to 516.7 m RL constructed as per specifications within Figure 7 of Schedule 1; (b) Decant tower raise as per specifications within Figure 9 and Figure 10 of Schedule 1; (c) Eastern toe drain tower raise as per specifications within Figure 10 of Schedule 1; (d) Underdrainage tower raise as per specifications within Figure 11 of Schedule 1; and (e) Installation of nine new piezometers to replace decommissioned piezometers from stage 10 (if not already installed as part of another). Locations and specifications as Figure 12 and Figure 13 of Schedule 1	TSF cell B as shown in Figure 6 and Figure 8 of Schedule 1.

Compliance reporting

3. The works approval holder must within 30 calendar days of an item of Critical Containment Infrastructure identified by condition 2 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 2; and

(b) prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.

4. The Critical Containment Infrastructure Report required by condition 3 must include as a minimum the following:

(a) certification by a suitably qualified geotechnical engineer that each item of critical containment infrastructure or component thereof, as specified in condition 2, has been built and installed in accordance with the requirements specified in condition 2;

(b) as constructed plans and a detailed site plan showing the location and dimensions for each item of critical containment infrastructure or component thereof, as specified in condition 2;

(c) photographic evidence of the installation of the infrastructure; and

(d) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Time limited operations phase

Commencement and duration

5. The works approval holder may only commence time limited operations for an item of critical containment infrastructure identified in condition 2:

(a) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 3 meets the requirements of that condition; or

(b) where at least 30 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 3 has been submitted to the CEO.

6. The works approval holder may conduct time limited operations for the stage 9 cell B embankment lift specified in condition 10:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 5 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 6(a).

7. The works approval holder may conduct time limited operations for the stage 10 cell B embankment lift specified in condition 10:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 5 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 7(a).

8. The works approval holder may conduct time limited operations for the stage 11 cell A embankment lift specified in condition 10:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 5 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 8(a).

9. The works approval holder may conduct time limited operations for the stage 11 cell B embankment lift specified in condition 10:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 5 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 9(a).

Time limited operations requirements

10. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 2 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 2.

Table 2: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Tailings storage facility: construction stage 9, cell B, embankment lift to 511.4 m RL	(a) Operated with a minimum embankment height freeboard of 500mm or containment of a 1 in 100 year 72 hour storm event (whichever is greater); and (b) Visual inspections every 12 hours and prior to and following significant rainfall events to check: i. Freeboard capacity ii. Location and size of the decant pond (expressed in hectares and as a total percentage of the surface area of the TSF); iii. Change in seepage conditions or sudden change in water level; and iv. Signs of erosion.	TSF cell A and B as shown in Figure 2 and Figure 6 of Schedule 1.
2.	Tailings storage facility: construction stage 10, cell B, embankment height 514.6 m RL		
3.	Tailings storage facility construction stage 11, cell A, embankment height 516.7 m RL		
4.	Tailings storage facility construction stage 11, cell B, embankment height 516.7 m RL		

Emissions and discharges

11. The works approval holder must ensure that the emissions specified in Table 3, are discharged only from the corresponding discharge point and only at the corresponding discharge point location.

Table 3: Authorised emissions and discharge location

Emission	Discharge point location
Tailings from the Northern Star Thunderbox mining operation	TSF cell A and B and shown in Figure 2 and Figure 6 of Schedule 1

Monitoring during time limited operations

12. The works approval holder must monitor emissions:

(a) at the corresponding monitoring location;

(b) for the corresponding parameter;

(c) at the corresponding frequency;

(d) in the corresponding unit;

as set out in Table 4.

Table 4 Monitoring during time limited operations

Monitoring location	Parameter	Frequency	Unit
Vibrating wire piezometers (stage 10 and 11)	Phreatic surface	Monthly[1]	Pore water pressure
TSF cell A and B decant pond	Decant pond size	Weekly	Hectares and percentage of total area

Note 1: Monthly monitoring is undertaken at lease 15 calendar days apart

Monitoring of water balance during time limited operations

13. The works approval holder must review and assess the water balance for the TSF each monthly period, and (as a minimum) record the following information:

(a) site rainfall;

(b) evaporation rate;

(c) decant water recovery volumes;

(d) volume of tailings deposited;

(e) percentage of solids within the tailings slurry; and

(f) estimate of seepage losses.

Compliance reporting – time limited operations

14. The works approval holder must submit to the CEO a report on each stage of the time limited operations (construction stages as specified in Table 2) within 30 calendar days of the completion date of that stage time limited operations.

15. The works approval holder must ensure the reports required by condition 14 include the following:

(a) a summary of the time limited operations, including timeframes and amount of ore processed;

(b) a summary of monitoring results obtained during time limited operations under conditions 12 and 13;

(c) a review of performance and compliance against the conditions of the works approval; and

(d) where the manufacturer's design specifications and the conditions of this works approval have not been met, what measures will the works approval holder

take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

16. The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.

17. The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:

(a) the works conducted in accordance with condition 2;

(b) any maintenance of infrastructure that is performed in the course of complying with conditions 2 and 10 ;

(c) monitoring undertaken in accordance with conditions 12 and 13; and

(d) complaints received under condition 16.

18. The books specified under condition 17 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the works approval holder for the duration of the works approval; and

(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 5 have the meanings defined.

Table 5: Definitions

Term	Definition
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
critical containment infrastructure	means the items of infrastructure listed in condition 2.
Critical Containment Infrastructure Report	means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with the works approval.
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V Division 3 of the EP Act.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
premises	the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map Figure 1 in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
suitably qualified geotechnical engineer	means a person who: (a) holds a relevant degree in engineering; and (b) has a minimum of three years of experience working as an engineer.

Term	Definition
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.

END OF CONDITIONS

Schedule 1: Maps

Premises map

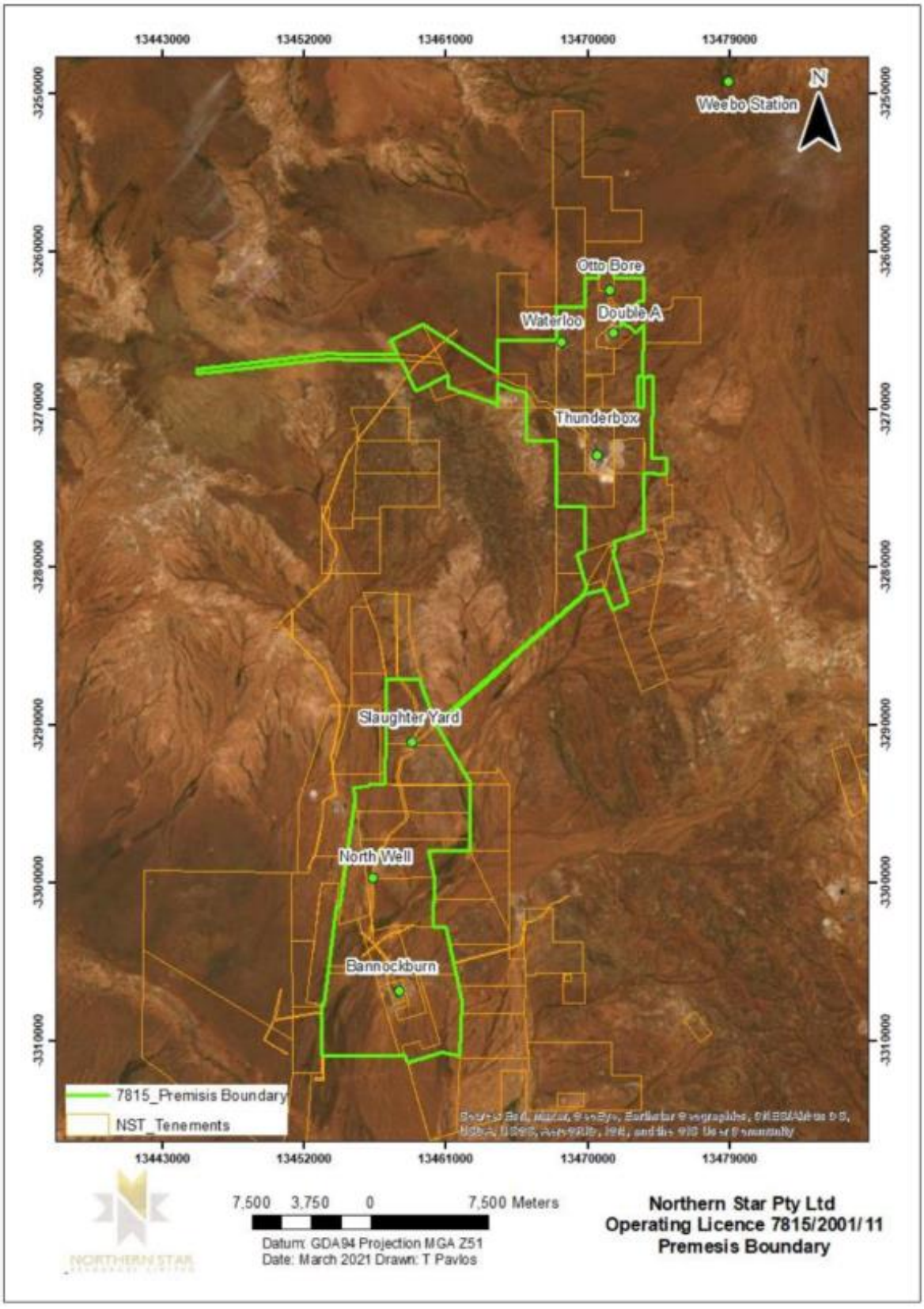

Figure 1: Map of the boundary of the prescribed premises (green)

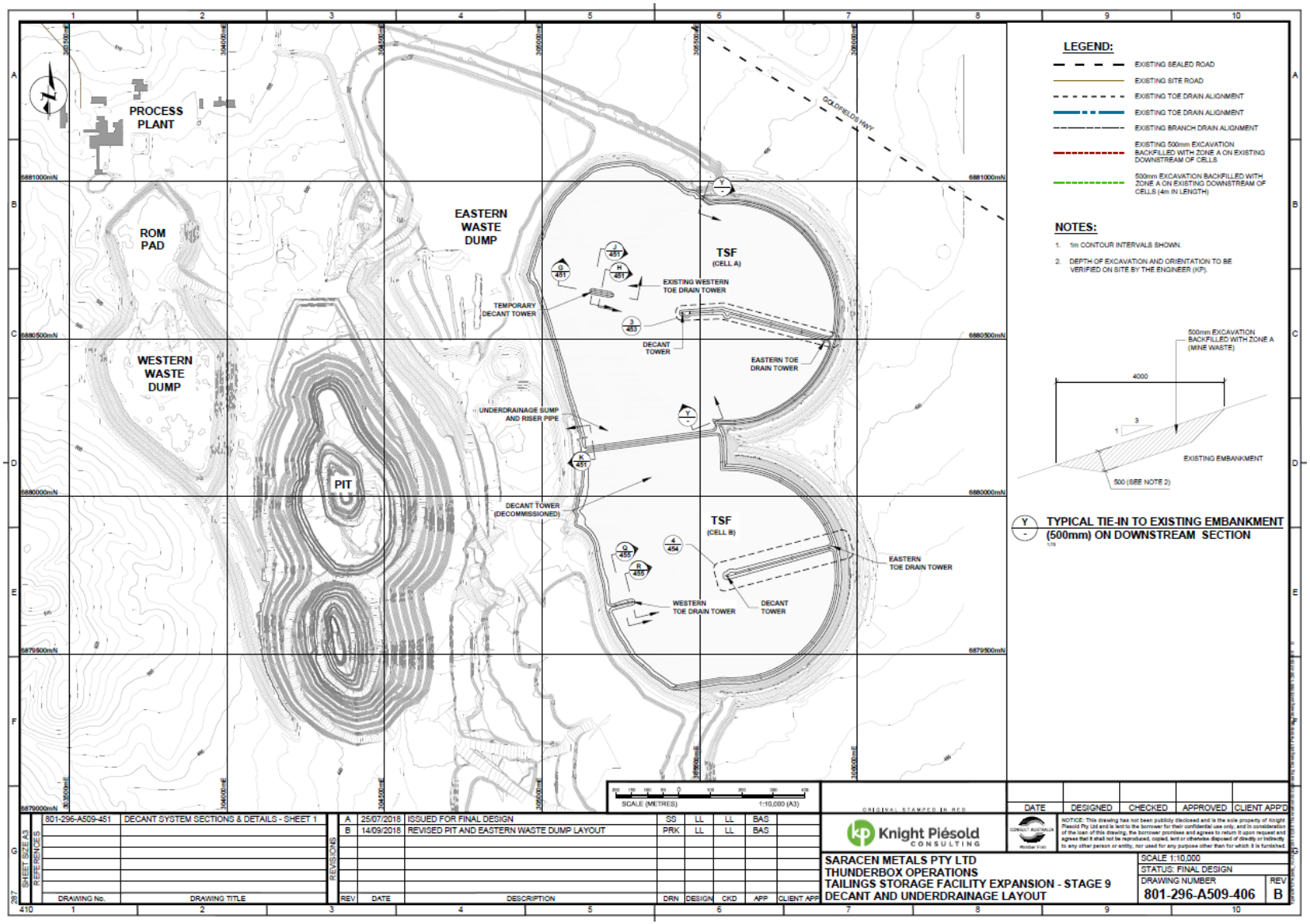

Figure 2 Stage 9 Tailings Storage Facility Expansion

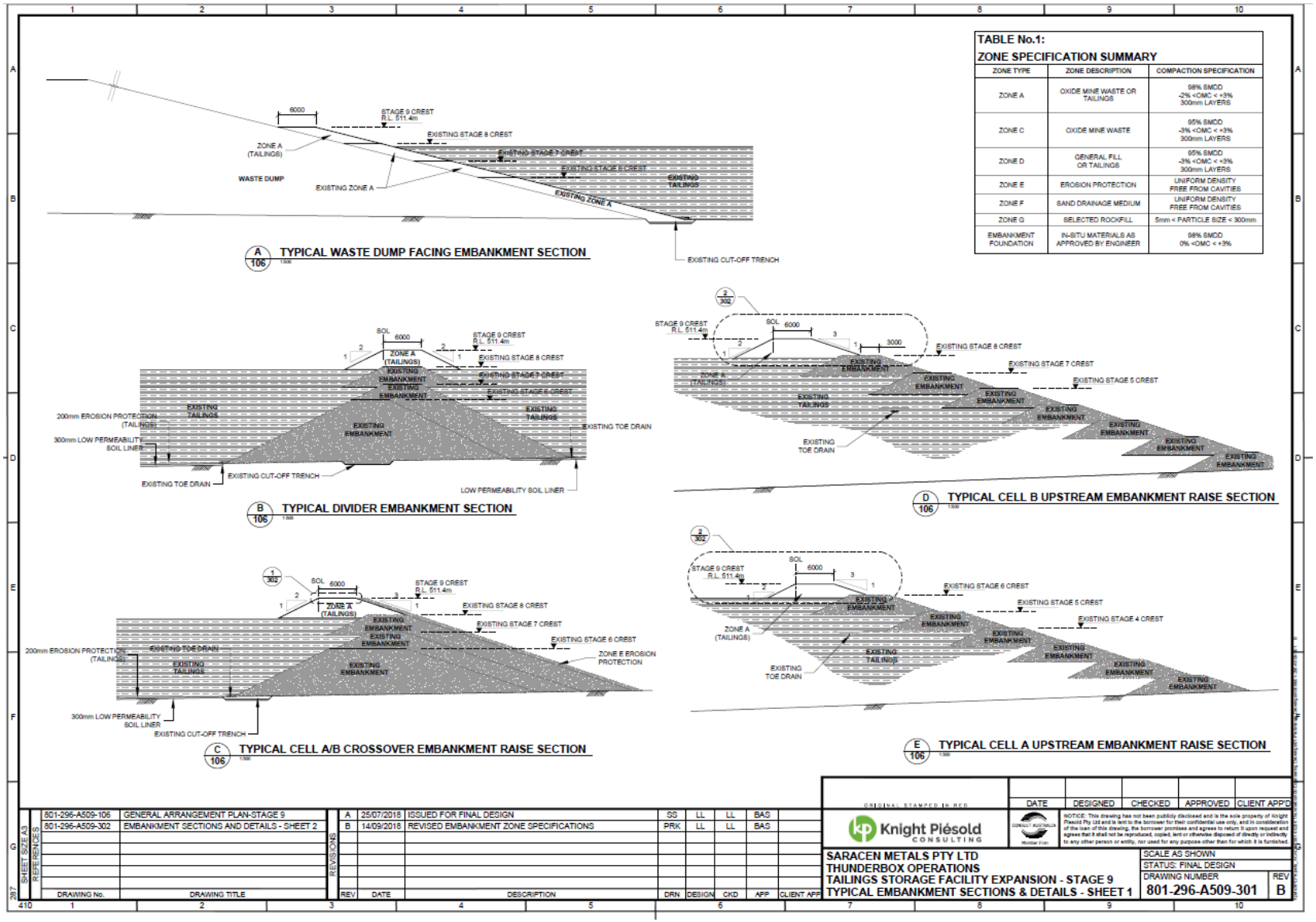

Figure 3 Stage 9 embankment lift

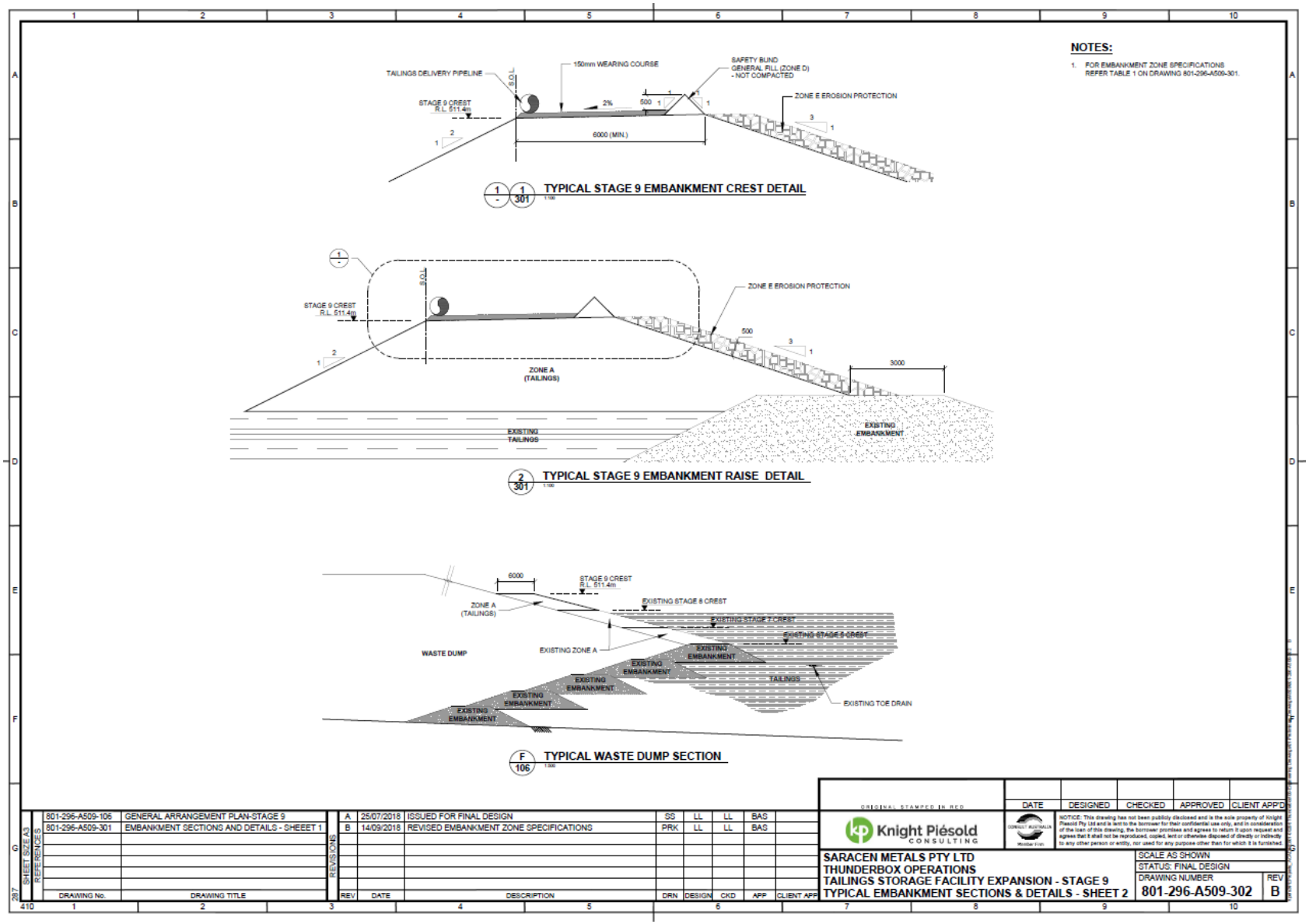

Figure 4 Stage 9 embankment lift detail

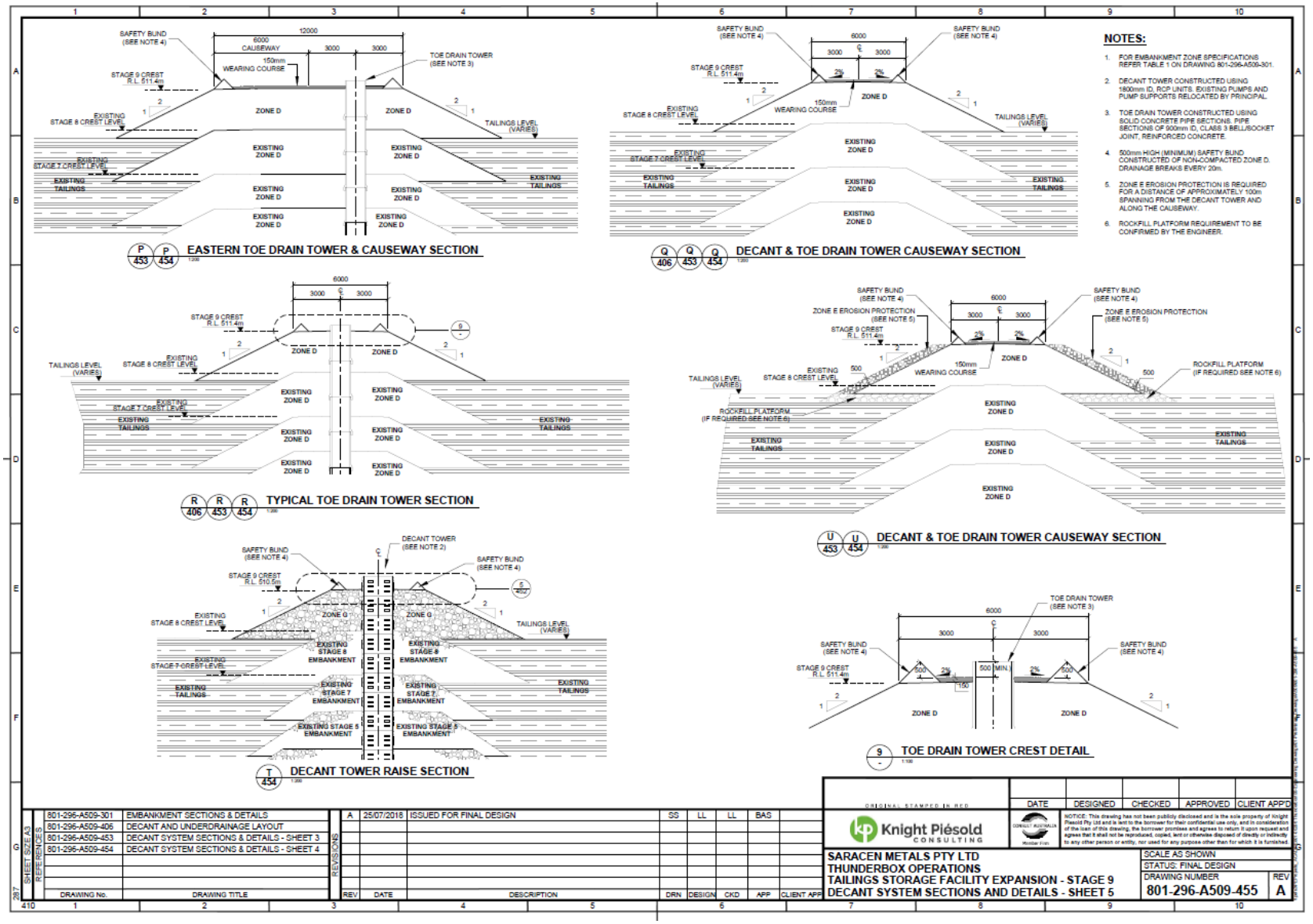

Figure 5 Stage 9 decant and toe drain tower detail

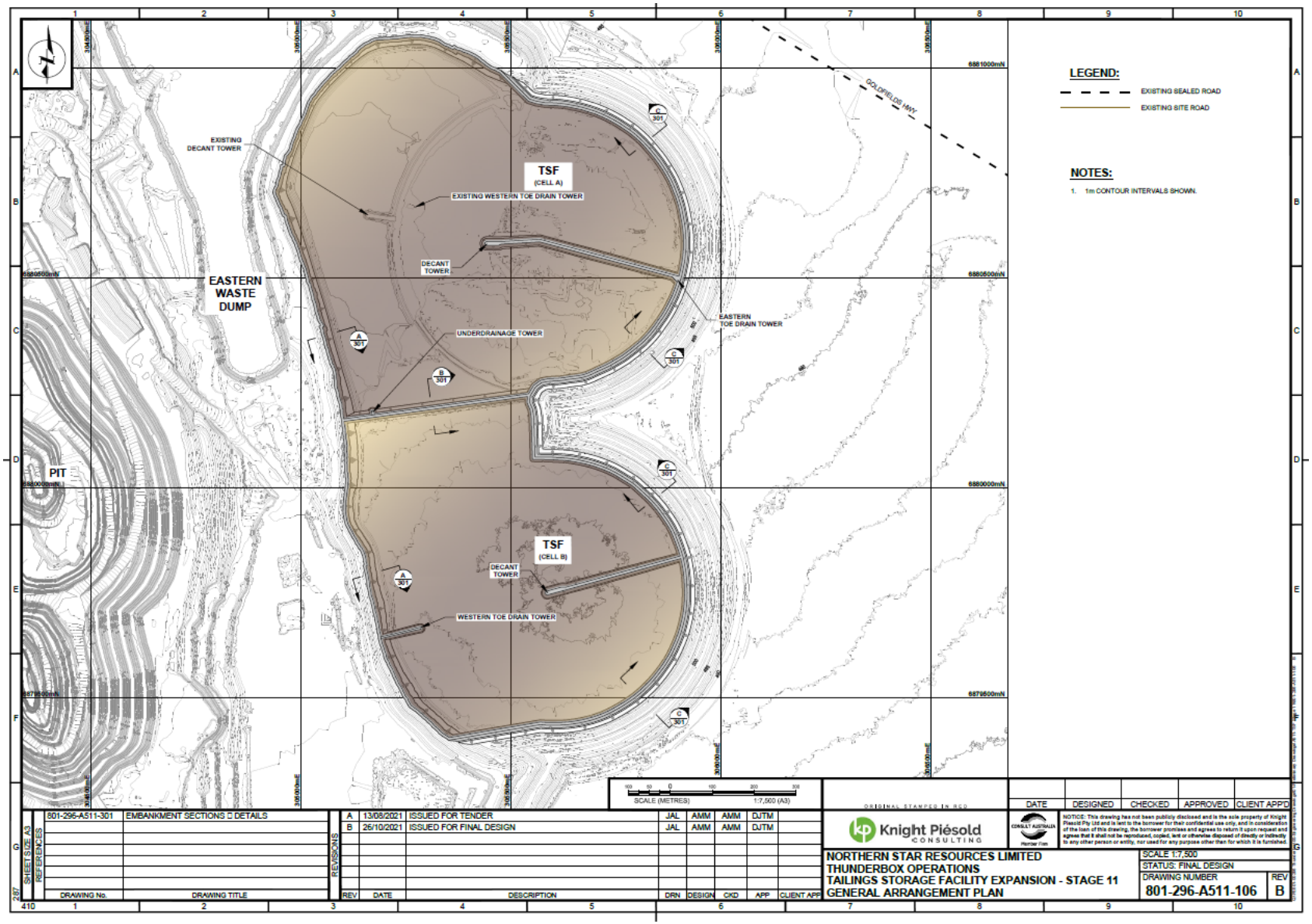

Figure 6 Stage 10 and 11 expansion

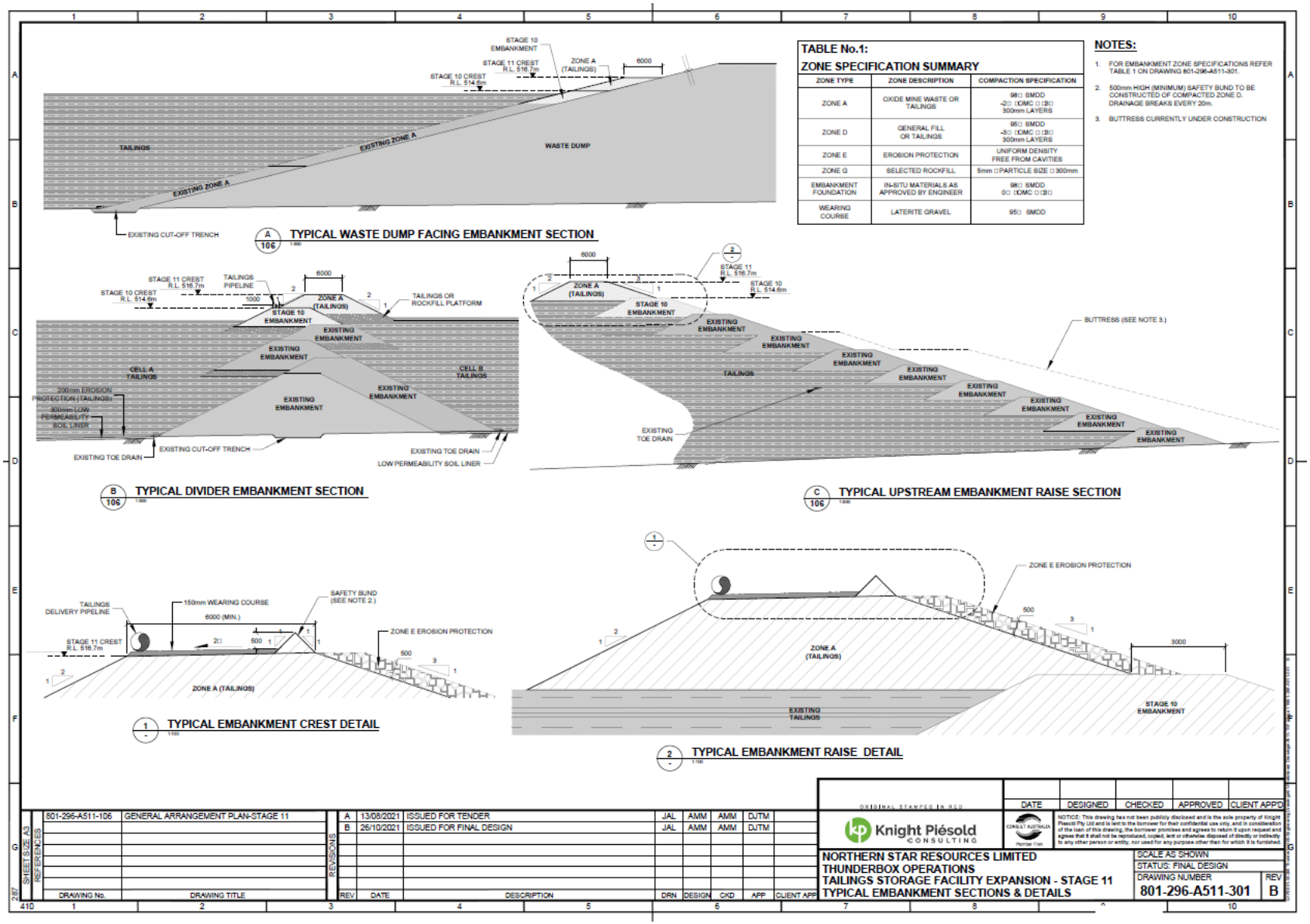

Figure 7 Stage 10 and 11 expansion - embankment lifts

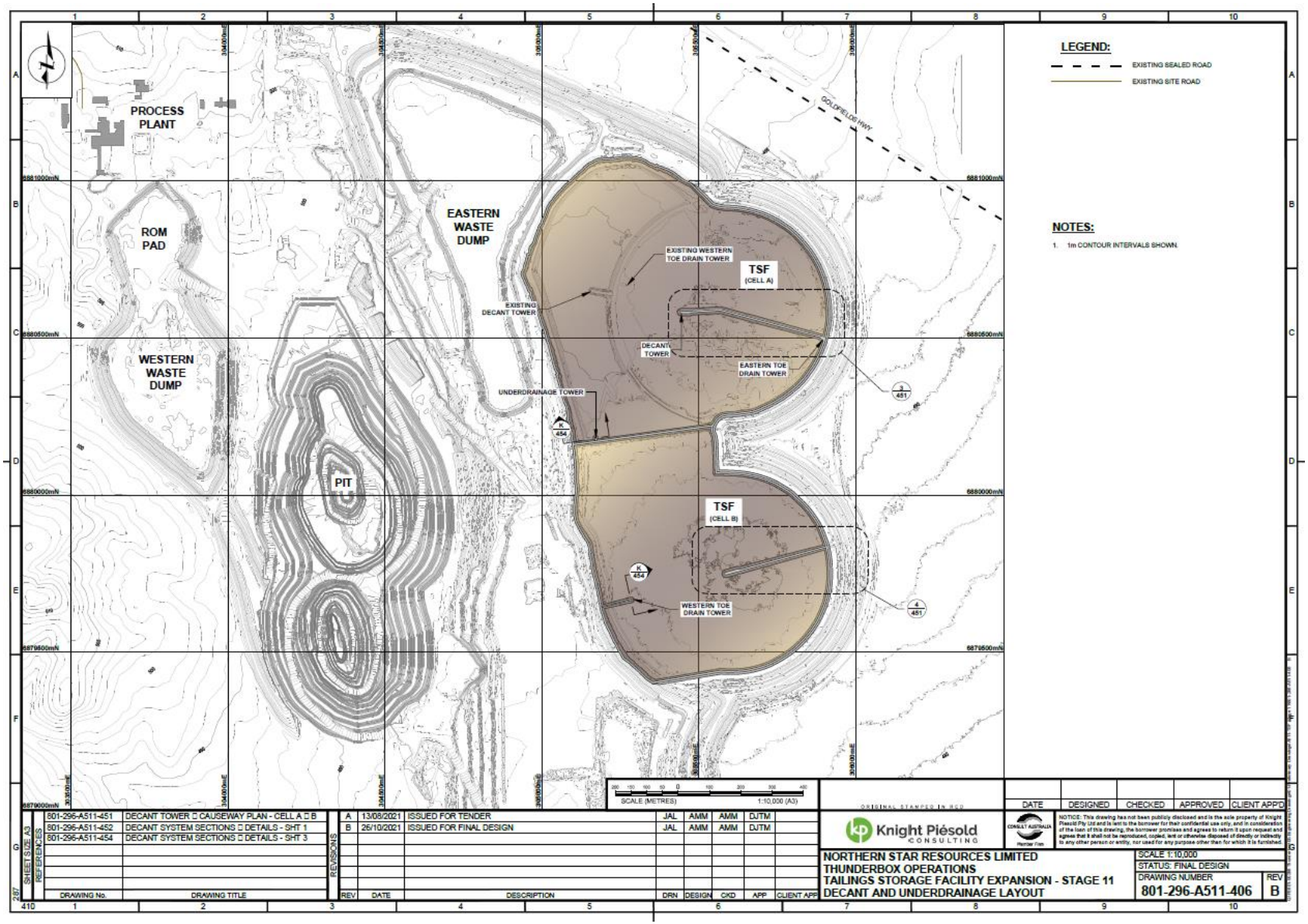

Figure 8 Stage 10 and 11 - decant and underdrainage layout

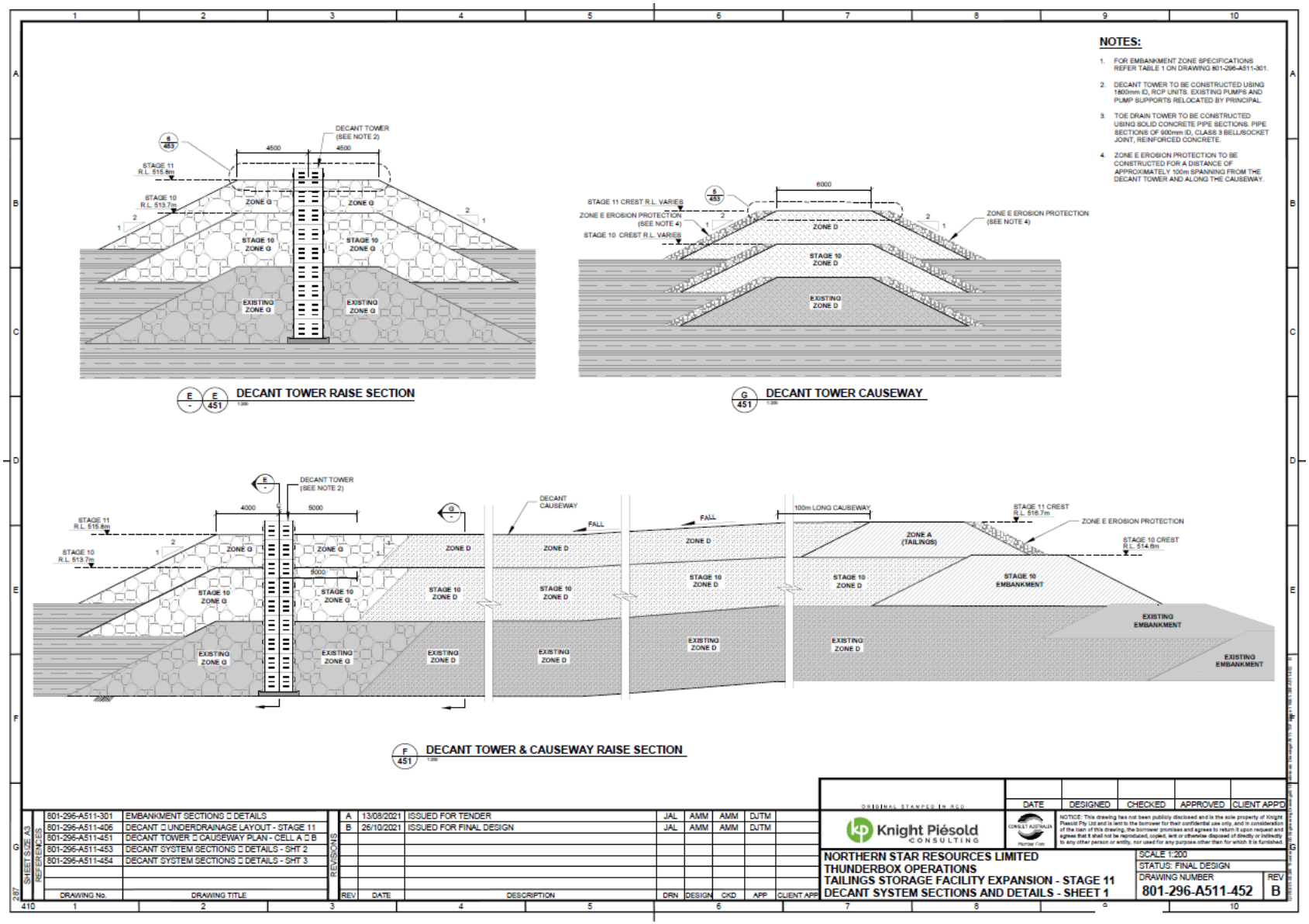

Figure 9 Stage 10 and 11 decant tower raise

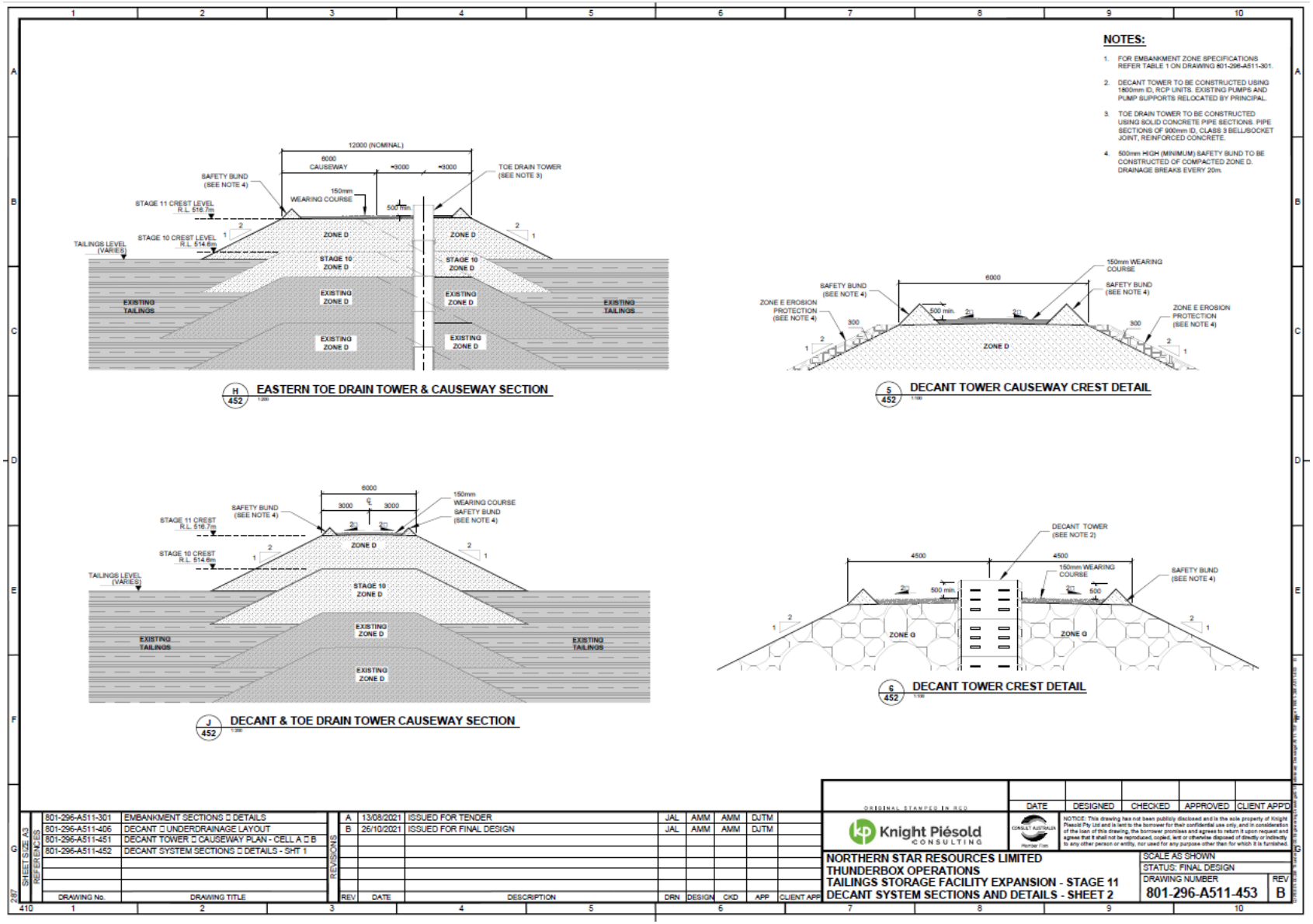

Figure 10 Stage 10 and 11 decant tower and eastern toe drain raise

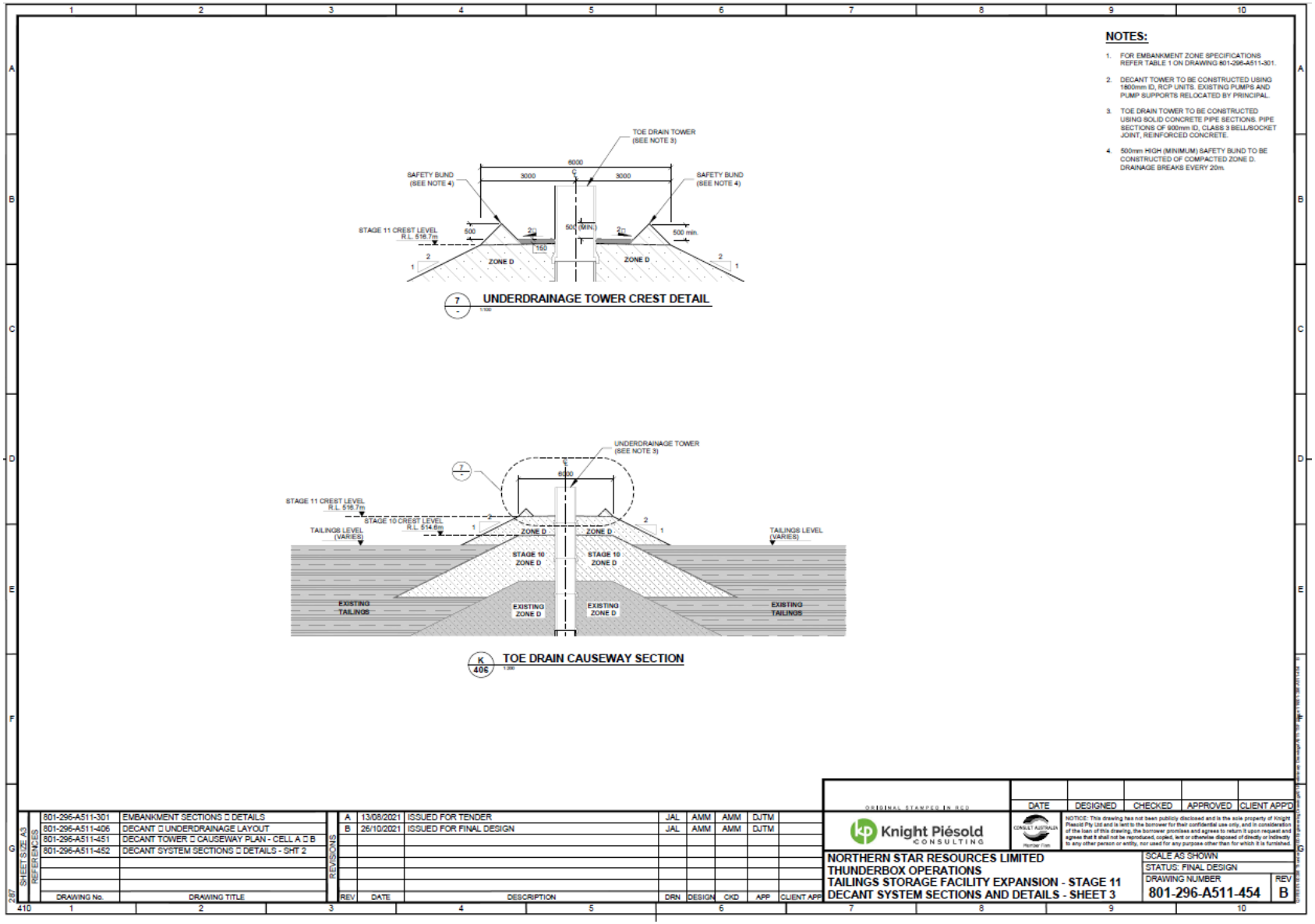

Figure 11 Stage 10 and 11 underdrainage tower and toe drain causeway section

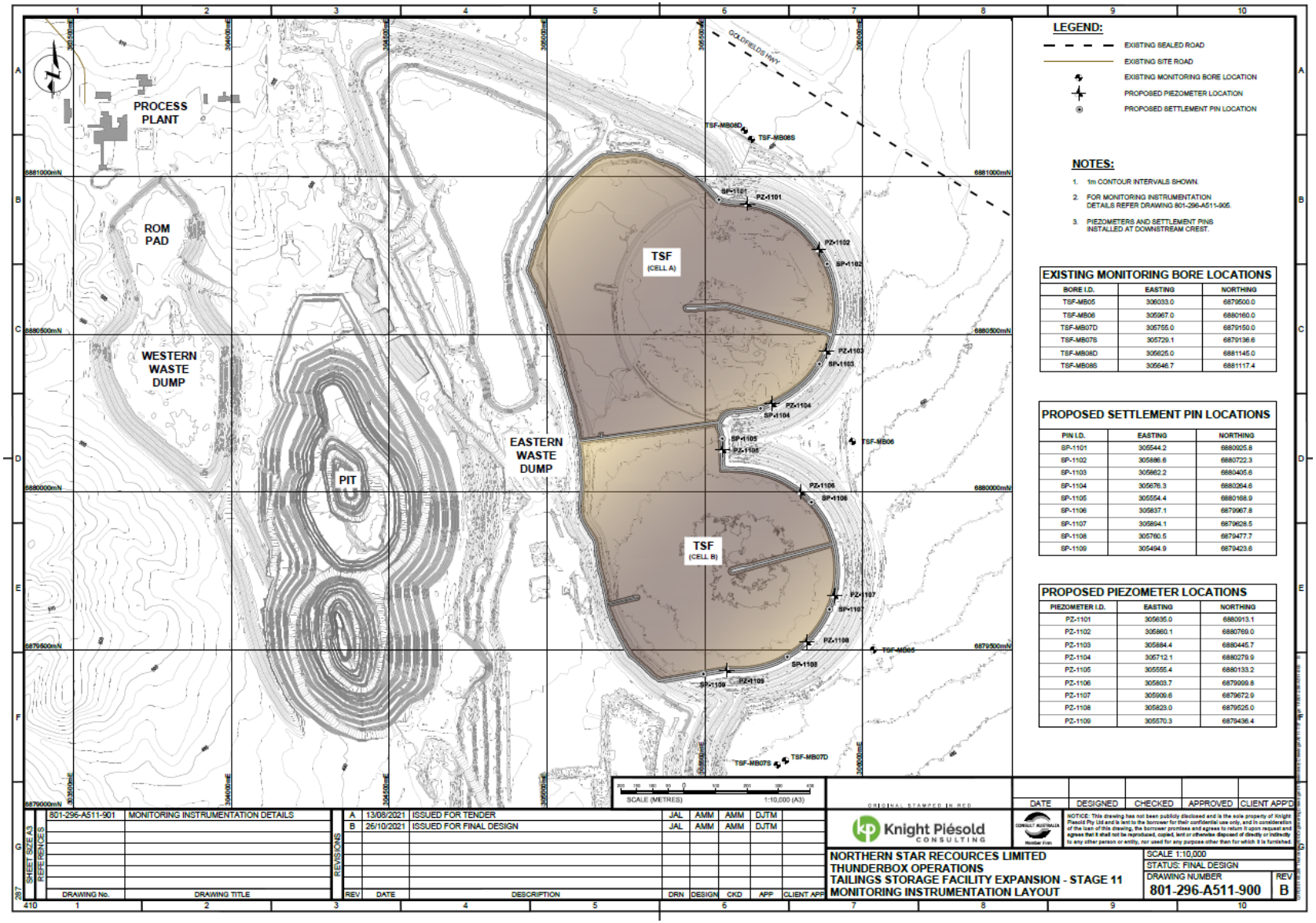

Figure 12 Piezometer locations for stages 10 and 11

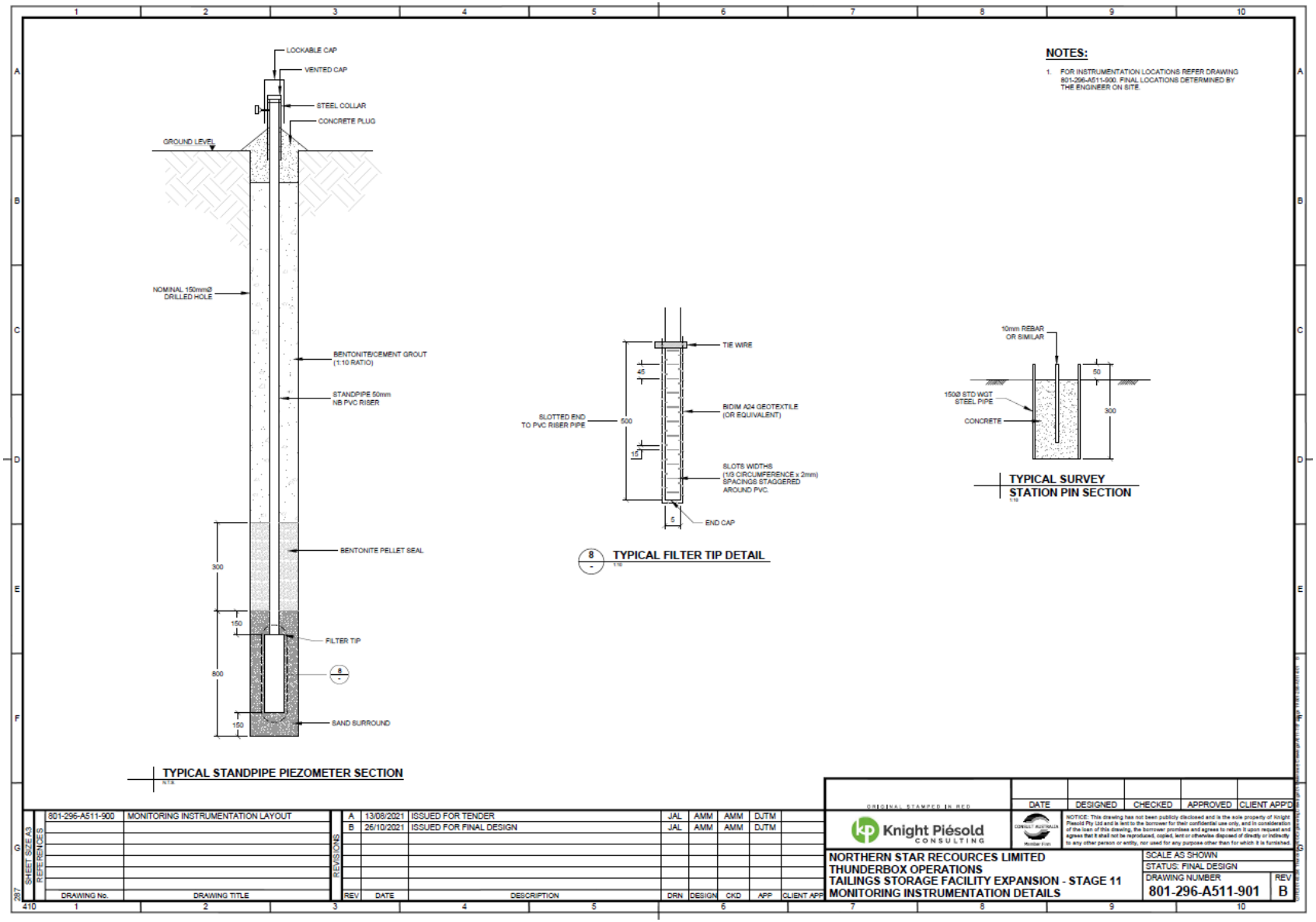

Figure 13 Piezometer construction detail