



Memo

To: Gavin Donaghy (Northern Star Resources Limited)
From: Elham Shafieiyoun, Helvecio Duarte
Subject: **KCGM Thermal Power Station Hydrological Assessment**
Our ref: PS227418-WSP-PER-MNG-MEM-001 Rev0
Date: **16 December 2025**

1. Introduction

Northern Star Resources Limited (NSR) has engaged WSP Australia Pty Limited (WSP) to carry out a stormwater assessment on an area south of the North Kal Mine to support future power station developments, which involves the construction of a Thermal Power Station.

1.1 Background

WSP previously supported Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM), a subsidiary of NSR, with several hydrological studies (WSP, 2023). As a result, WSP has developed a TUFLOW flood model for the Eastern floodway that was utilised in this study as a flood planning and design tool. WSP has updated the existing TUFLOW model, modifying the model extent to suit the proposed power station footprint and upstream reporting catchment.

1.2 Objectives

The objectives of this study are:

- Review of site setting and project data assessment.
- Undertake an existing (pre-development) and post-development case stormwater assessment to compare changes in flow regime and surface water impacts of the development.
- Delineate catchments for the study extent for the two cases based on available topography.
- Undertake hydrological modelling for pre- and post-development cases.
- Estimate design floods for the 1:100 annual exceedance probability (AEP) and critical duration storm events.
- Undertake two-dimensional (2D) hydraulic modelling for existing and post development cases.
- Provide conceptual design for diversion channel and culvert based on 1:100 AEP storm event.

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WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.



2. Site setting

NSR's proposed Thermal Power Station is located within the Eastern Floodway catchment and is one of the two primary catchments draining into Hannan Lake, located approximately 4 km northeast of Kalgoorlie. The Eastern Floodway water course, located approximately 3 km to the east of the site, runs north to south.

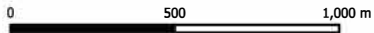
The site is predominantly characterised by natural catchment areas with altered catchment landforms to the east including the Parkeston Train Station and Yarri Road Waste Disposal Centre and to the west including the old Hannan's Mine and North Kal Mine. An overview of the existing site layout including proposed site landform is displayed in Figure 2.1.

Site catchments and drainage lines were delineated for existing and post-development scenarios as shown in Figure 2.2 and Figure 2.3, respectively. Site catchments were assessed based on the latest topographical survey data and landform designs provided by NSR.

LEGEND

- Railway Lines
- Main Roads
- Proposed Thermal Power Station
- Eastern Floodway

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
 Universal Transverse Mercator (UTM)

Project: KCGM Thermal Power Station Hydrological Assessment

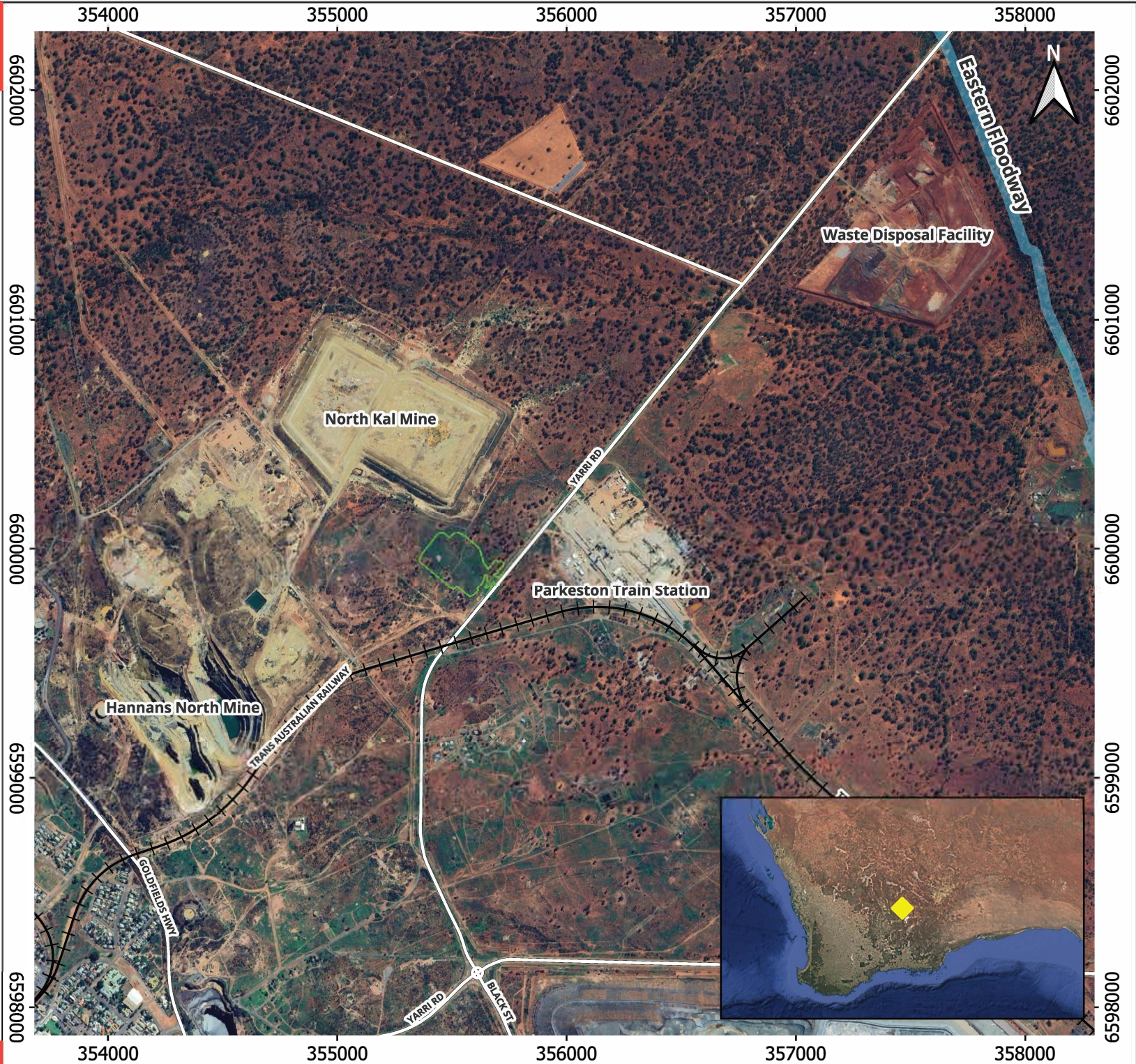
Client: Northern Star Resources Limited

Title: Site layout

Version: Final
 Project No: PS227418
 Rev: 0
 Figure No: 2.1

Designed: ES
 Prepared: ES
 Reviewed: HD
 Approved: GH
 Date: 09/12/2025

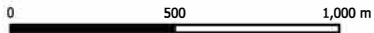
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LEGEND

-  Railway Lines
-  Main Roads
-  Eastern Floodway
-  Streamlines
-  2m Topographical Contours
-  Model Extent

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
 Universal Transverse Mercator (UTM)

Project: KCGM Thermal Power Station Hydrological Assessment

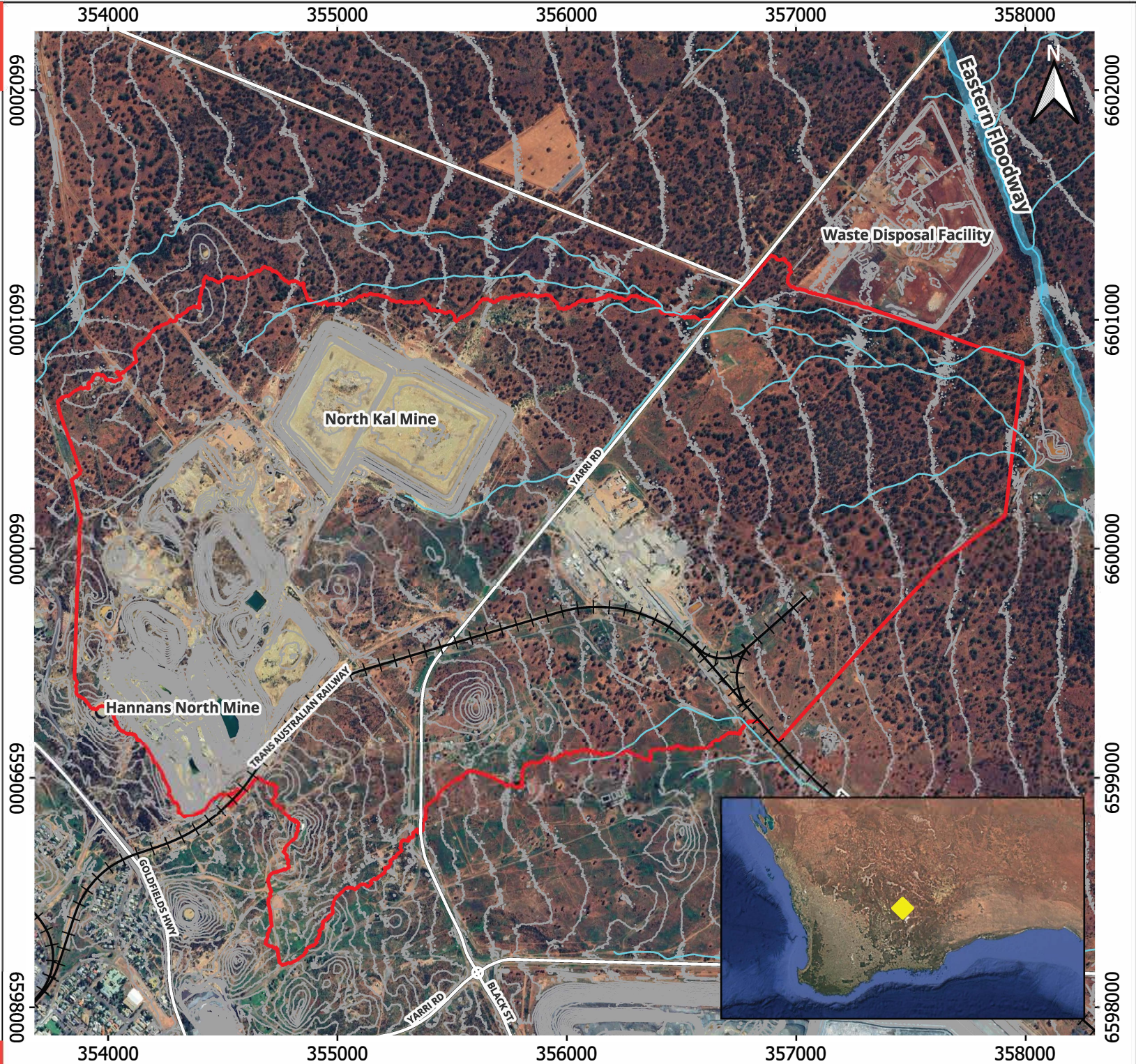
Client: Northern Star Resources Limited

Title: Pre-development scenario with existing hydrology

Version: Final
 Project No: PS227418
 Rev: 0
 Figure No: 2.2

Designed: ES
 Prepared: ES
 Reviewed: HD
 Approved: GH
 Date: 04/12/2025

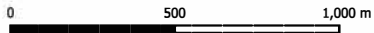
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LEGEND

- Railway Lines
- Main Roads
- Eastern Floodway
- Streamlines
- 2m Topographical Contours
- Proposed diversion channel
- Proposed Thermal Power Station
- Model Extent

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
Universal Transverse Mercator (UTM)

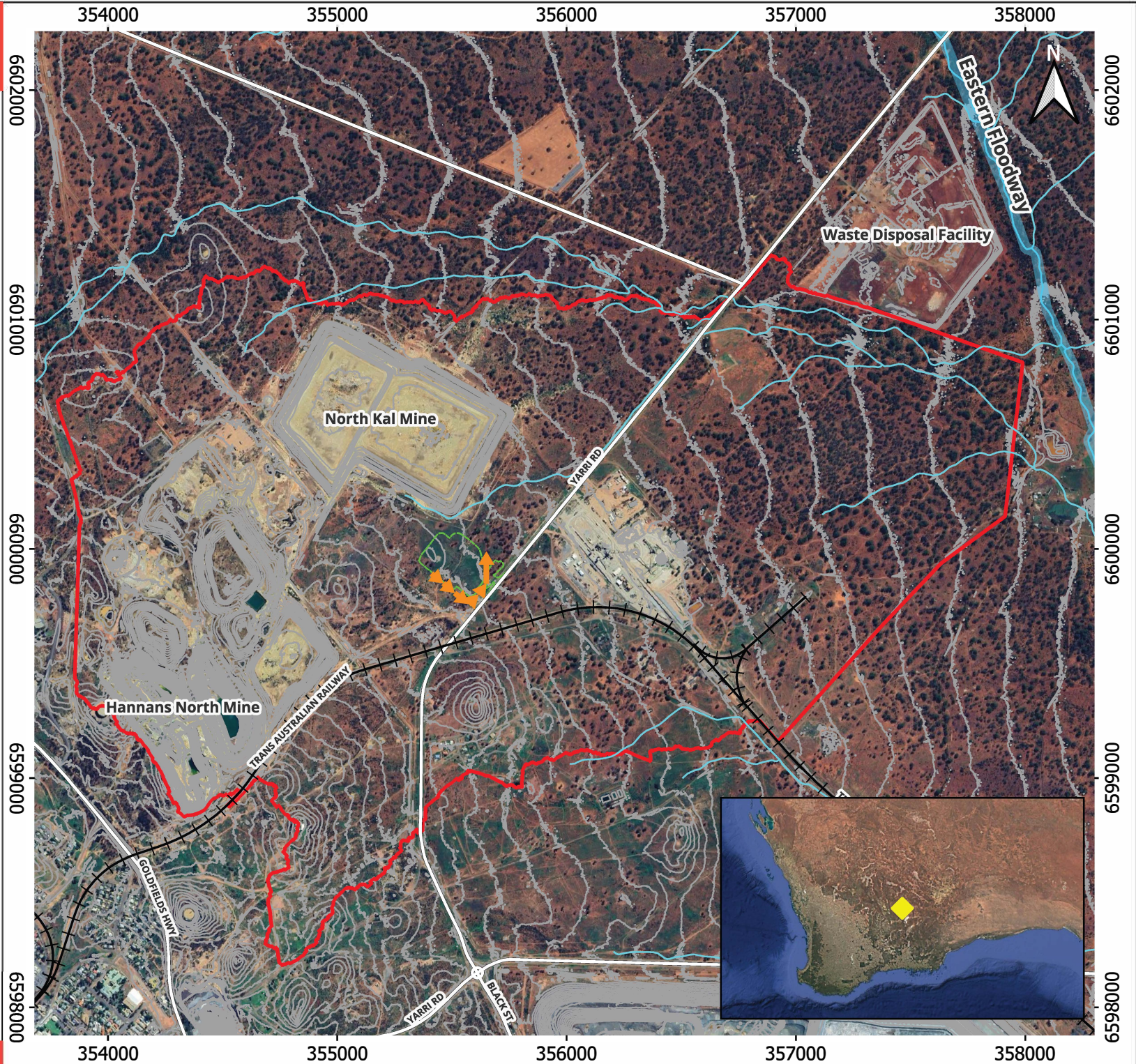
Project: KCGM Thermal Power Station Hydrological Assessment

Client: Northern Star Resources Limited

Title: Post-development scenario with stormwater management

Version: Final
Project No: PS227418
Rev: 0
Figure No: 2.3

Designed: ES
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Approved: GH
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3. Basis of design

A summary of basis of design criteria for diversion channel infrastructure is presented in Table 3.1.

Table 3.1 Design criteria for diversion channel infrastructure

Parameter	Design Input	Established by	Source
Diversion channel (with freeboard allowance)	1:100 AEP (1 in 100-year)	WSP/NSR	(MRWA, 2006)
Freeboard	0.3 m	WSP	-
Side slopes	1V:3H	WSP	-
Minimum longitudinal grade	0.3%	WSP	(MRWA, 2021)
Maximum acceptable flow velocity without erosion protection	2 m/s	WSP	(MRWA, 2006)
Manning's roughness (unlined)	0.03	WSP	(Chow, 1959)

3.1 Proposed power station landform and hydrological impacts

The proposed Thermal Power Station is located the south of the North Kal Mine on the northern side of Yarri Road. Sub-catchment drainage lines flow in an easterly direction and discharge into the Eastern Floodway, which subsequently flows through the Bulong Road floodway and continues further south. The designed earthwork drawings are presented in Appendix A.

3.2 Proposed stormwater management/mitigation

The proposed power station landform intersects several sub-catchment drainage lines that would possibly impact discharge of runoff to the downstream sub-catchments. Without an engineered diversion, the surface runoff from reporting catchment would accumulate against the landform and flow around it, resulting in greater water levels along Yarri Road during rare storm events compared to pre-development conditions.

To improve conveyance of surface water flows and reduce the hydrological impacts of the proposed landform, a major diversion channel is proposed to convey flows from all intersected drainage lines around the southern side of the proposed power station into an existing natural drainage line to the east. This diversion seeks to maximise the return of upstream flows to pre-development drainage lines in downstream catchments and minimise changes to the existing hydrological regime. The designed stormwater diversion drawings are presented in Appendix A.

4. Hydrologic and hydraulic modelling

Hydrologic and hydraulic modelling was undertaken to assess the impacts of the proposed landforms and associated stormwater management infrastructure. A summary of the modelling is provided in the following sections.

4.1 Model description

A 2D hydraulic model was previously developed for the Eastern Floodway catchment upstream of Bulong Road using the TUFLOW modelling software package (BMT WBM, 2023). TUFLOW is a 2D hydraulic model with an unsteady-state flow routing component and is widely used in Australia and globally.

4.2 Model inputs and assumptions

A summary of the hydraulic model inputs and assumptions is outlined below.

- **Digital Elevation Model (DEM)** – The model DEM adopted for the hydraulic modelling was provided by KCGM:
- **KCGM_Superpit2111_DEM-GRID_001_350500_6600000_500m.asc** – A set of 1 m grid cell resolution surveys covering the Eastern Floodway area north of Bulong Road and sub-catchments upstream of Fimiston II TSF to the northeast (dated 20 January 2022).

- **DEM Alterations** – The following alteration was made to the model DEM:
 - The Thermal Power Station landform and diversion channel design were provided by NSR and dated November 2025.
- **Model Extent** – The model area was selected to include the catchment to the west of the Eastern Floodway watercourse downstream of the old Hannan’s Mine and North Kal Mine where detailed LiDAR survey was available.
- **Model Inflows** – The direct rainfall method was adopted to simulate catchment runoff in the model based on applying the design rainfalls (presented in Section 4.3) to all cells within the 2D model domain. Aerial reduction factors were applied to the design rainfalls based on the approach outlined in Australian Rainfall and Runoff (ARR) guidelines (Ball, et al., 2019). Rainfall losses were incorporated in the model as described in Section 4.4.
- **Model Outflow Boundary** – A stage–discharge (HQ) boundary was adopted at the model outlet located downstream of Yarri Road. This stage-discharge curve was calculated based on the average bed slope at the model outlet assuming normal depth conditions, and at a sufficient distance downstream of the proposed development such that it had no impact on the model results.
- **Manning’s Roughness coefficient** – A summary of the Manning’s roughness coefficients applied to the TUFLOW model is presented in Table 4.1.
- **2D Grid resolution** – A 2D grid resolution of 3 m was optimally chosen to maintain model accuracy while minimising model run times.
- **Culverts** – A culvert was incorporated as a one-dimensional link within the model. A summary of the adopted culvert dimension is presented in Table 4.2.

The adopted hydraulic model setup is displayed in Figure 4.1.

Table 4.1 Manning’s roughness coefficients adopted within TUFLOW model

Model Area	Manning’s Roughness Value Adopted	Flow Path Description	Source
Overland flow areas and floodplains	0.04	Scattered brush and heavy weeds	(Chow, 1959)
Diversion channel	0.03	Unlined earth channels with moderate irregularity	
Thermal Power Station	0.016	Overland flow on asphalt	Adopted
Culvert	0.014	Concrete box	(Main Roads WA, 2019)

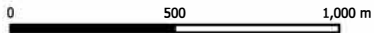
Table 4.2 Summary of modelled culvert dimension

Culvert ID	Width (m)	Height (m)	Number of Culvert Barrels	Culvert Type
C1	2.1	0.6	2	Rectangular box culvert

LEGEND

- Model outflow boundary
- Culvert
- Proposed diversion Channel
- Proposed Thermal Power Station
- Model Extent

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
Universal Transverse Mercator (UTM)

Project: KCGM Thermal Power Station Hydrological Assessment

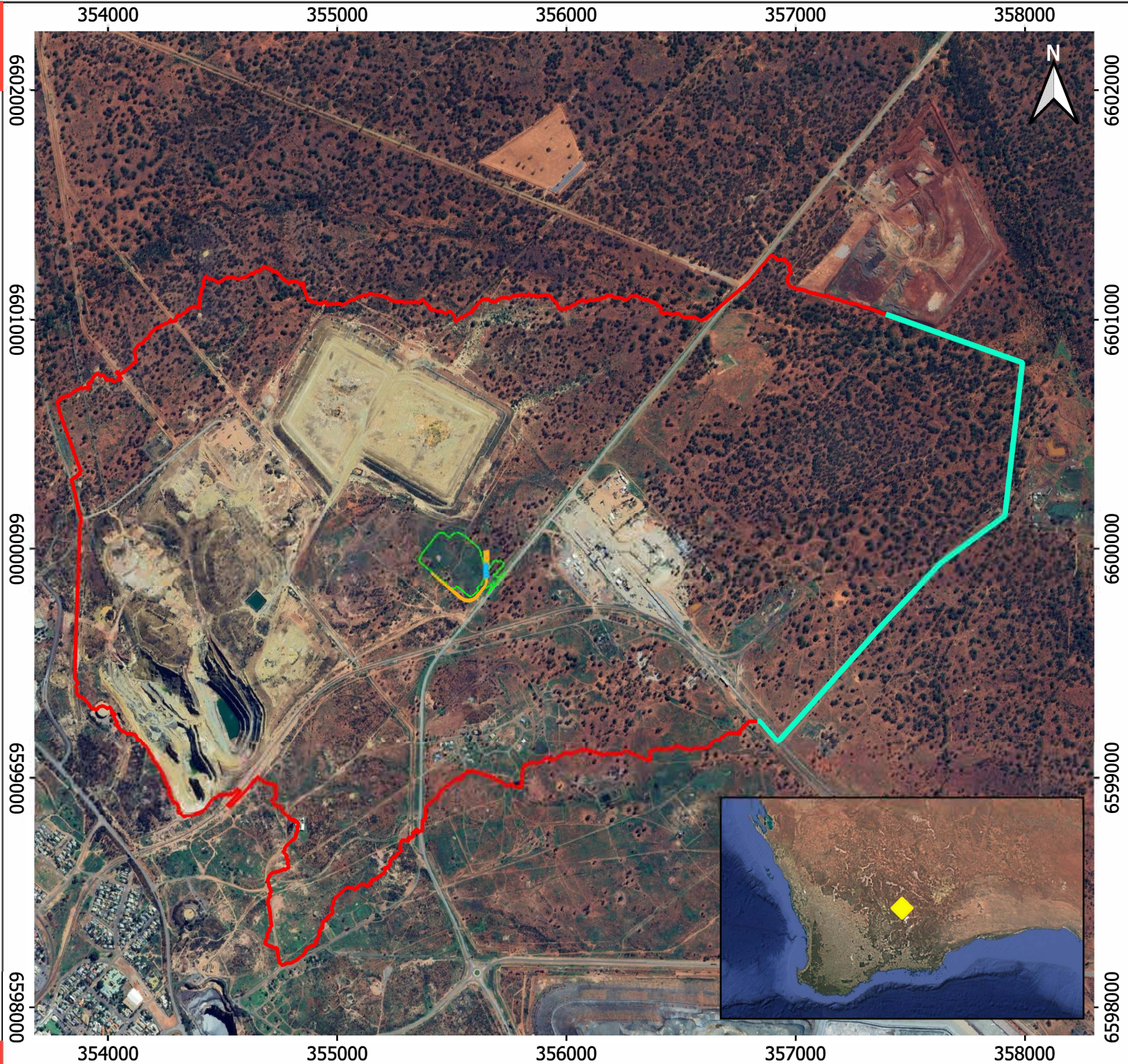
Client: Northern Star Resources Limited

Title: TUFLOW model setup

Version: Final
Project No: PS227418
Rev: 0
Figure No: 4.1

Designed: ES
Prepared: ES
Reviewed: HD
Approved: GH
Date: 04/12/2025

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4.3 Design rainfalls

Design rainfall estimates for the site location (30.72°S, 121.49°E) were sourced from the Bureau of Meteorology Design Rainfall Data System (Bureau of Meteorology (BoM), 2025) for durations between 1 hour and 48 hours for 1:100 AEP event as outlined in Table 4.3.

Table 4.3 Design rainfall depths (mm)

Duration	1:100 AEP
1 hr	50.3
2 hrs	62.5
3 hrs	71.5
6 hrs	91.5
9 hrs	107
12 hrs	119
18 hrs	138
24 hrs	152
30 hrs	164
36 hrs	173
48 hrs	187

4.4 Rainfall losses

Rainfall losses associated with soil infiltration are important to estimate the rainfall-runoff response of a catchment during a storm event. To estimate the amount of rainfall-runoff generated within catchments in the study area the Initial Loss – Continuing Loss (ILCL) model was adopted. The initial loss (IL) is defined as the amount of rainfall lost through infiltration before the start of surface runoff, while the continuing loss (CL) is the ongoing average loss rate throughout the remainder of the rainfall event. Given the Eastern Floodway is located within the arid region where there is a lack of suitable gauged catchments to quantify these parameters, rainfall losses were unavailable through the ARR Data Hub website. Therefore, losses for the Eastern Goldfields region were adopted as described in the previous ARR Guidelines (Pilgrim & Institution of Engineers Australia, 1998) as summarised in Table 4.4. Given the paucity of flow data within arid regions of Western Australian and particularly in the Goldfields region due to a lack of gauged catchments and the ephemeral nature of the hydrology, a high level of uncertainty is therefore associated with the adopted rainfall loss parameters.

Table 4.4 Adopted initial and continuing rainfall losses

Storm AEP	Initial loss (mm)	Continuing loss (mm/hr)
1:100	38	3

4.5 Critical duration analysis

A critical duration analysis was undertaken to select the critical storm events to be adopted within the hydraulic modelling.

For the hydrologic modelling this involved estimating the critical storm durations resulting in the highest peak flows within the catchment at a location upstream of the proposed landform. This modelling was undertaken in TUFLOW modelling software and for the 1:100 AEP storm considered a combination of storm durations each with an ensemble of 10 rainfall temporal patterns. Based on the modelling results, the temporal pattern resulting in the median peak flow at the upstream of the proposed landform within the catchment was selected.

Table 4.6 presents the resulting critical storm duration, associated median storm temporal pattern and adopted peak design flow. The critical duration, which is a function of the rainfall losses reflecting the adopted infiltration by the catchment soils, is estimated to be 6-hours.

Table 4.5 Critical peak discharges for the catchment

AEP	Critical duration (hrs)	Temporal pattern	Peak flow (m ³ /s)
1:100	6	3	2

4.6 Conceptual diversion design

The conceptual design for the proposed trapezoidal diversion channel was based on an iterative approach. Initial designs were undertaken within the hydraulic model based on the results of the hydrologic modelling of the contributing upslope catchment. Peak flows conveyed through the diversion channels were subsequently estimated within the hydraulic model and used to refine diversion channel dimensions. Table 4.6 summarises the channel design parameters including the estimated peak flow rate, maximum flow velocity and dimensions of the proposed diversion channels.

Table 4.6 Summary of diversion channel design and dimensions

Design parameter	Diversion channel
1:100 AEP peak flow (m ³ /s)	2
1:100 AEP peak velocity (m/s)	1.75
Minimum longitudinal grade (%)	0.3
Side slopes, 1(V):X(H)	3
Base width (m)	2
Manning’s roughness coefficient	0.03
Maximum flood depth (m)	0.6

5. Results

5.1 Model scenarios

As outlined previously hydraulic modelling was undertaken for two model scenarios including the pre-development and the post-development including the proposed development and stormwater mitigation infrastructure. Model results showing maximum flood depths within the catchment for both scenarios are included in Appendix B. Table 5.1 summarises the results for the modelled scenarios along with the associated figure references.

Table 5.1 Modelled scenarios and figure references

Scenario	Description	Appendix
Pre-development	— Existing base topography	Appendix B
Post-development	— Existing base topography — Includes KCGM – Thermal Power Station — Includes the stormwater diversions for the proposed landform	Appendix B

Additionally, a flood level difference map has been prepared in Appendix C to compare the difference in flood levels between the pre-development and post-development scenarios. Table 5.2 summaries the figures presented in Appendix C.

Table 5.2 Flood level difference map

Scenario	Description	Appendix
Post-development flood level subtracted from pre-development	This map presents the difference in flood levels between the two cases. Areas coloured blue indicate locations where the flood levels have reduced under post-development conditions and areas coloured yellow-orange indicate locations where the flood levels have increased under post-development conditions.	Appendix C

5.2 Discussion on modelling results

The following key findings are provided based on the results of the hydraulic model results.

- The pre-development condition under the 1:100 AEP flood event (Appendix B) indicated localized inundation along Yarri Road around the development area. Hydraulic modelling results indicated that the floodway at the intersection of Yarri Road and the access road to Hannans North Tourist Mine, located immediately upstream of the proposed landform to the west, is predicted to overtop. The maximum flood depth across the road crest is estimated at approximately 0.08 m, which suggests minor overtopping. Flow routing analysis indicated that a preferred surface runoff floodway originates immediately downstream of Hannans North Mine and flows towards the intended landform footprint following natural topographic gradients. The flow path ultimately converges with the northern branch downstream of the proposed landform footprint, forming a combined flow regime that continues toward the lower catchment.
- For post-development scenario the proposed diversion channel conveys flows from drainage lines along the western flank of the proposed facility around the power station to be discharged at a single location downstream comparable to the pre-development condition. The proposed diversion channel will direct water away from the landform area, conveying stormwater east around the power station, providing flood protection for the thermal power station facility.
- The flood difference map presented in Appendix C shows the locations where flood levels differ under post-development conditions relative to pre-development conditions. The flood level differences are minor (less than 0.2 m) and only occurred in the immediate downstream area of the proposed facility, indicating the flood levels were reduced in areas directly downslope of the proposed landform and adjacent to Yarri Road (flood extents shaded blue). Flood levels increased within the designed stormwater diversion channel and in locations to which stormwater has been diverted (flood extents shaded yellow-orange). There were no additional impact on flood levels across Yarri Road or elsewhere within the model area as a result of the proposed development and diversion channels.

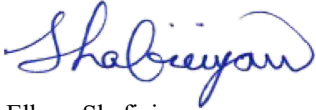
6. Limitations

In undertaking the analyses, it must be acknowledged that there may be limitations in accuracy of the modelling results as outlined below:

- Hydrologic modelling was undertaken to estimate the critical storm durations and associated median temporal pattern for 1:100 AEP that was subsequently applied in hydraulic modelling. The modelling also applies simplified rainfall-runoff routing equations to estimate the peak flow rates within the catchment. Although this approach is well suited to simulate a large number of storm events for a range of AEPs, durations and temporal patterns, a limitation of this technique is that it is unable to account for storage of surface runoff that can occur within topographical depressions or upslope of flow restrictions such as road embankments and mine landforms. As a result, the actual critical storm durations and median temporal patterns for the site may differ marginally to those presented in Section 4.5. Also, where depressions retain runoff that are not modelled the resulting estimated peak discharges downstream are likely to be less than presented in this report.
- Your attention is drawn to the document titled – “Statement of Limitations”, which is included in Appendix D of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Statement of Limitations document does not alter the obligations WSP has under the contract between it and its client.

7. Closing

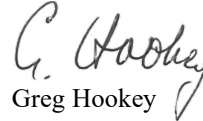
We trust that this technical memo provides sufficient information regarding the hydrological assessment of KCGM Thermal Power Station Project. Please do not hesitate to contact us if you require any further elaboration or clarification.



Elham Shafieiyoun
Project Water Resources Engineer



Helvecio Duarte
Senior Water Resources Engineer

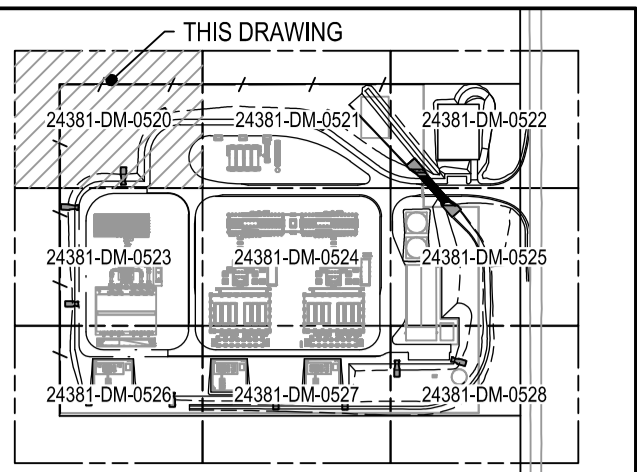
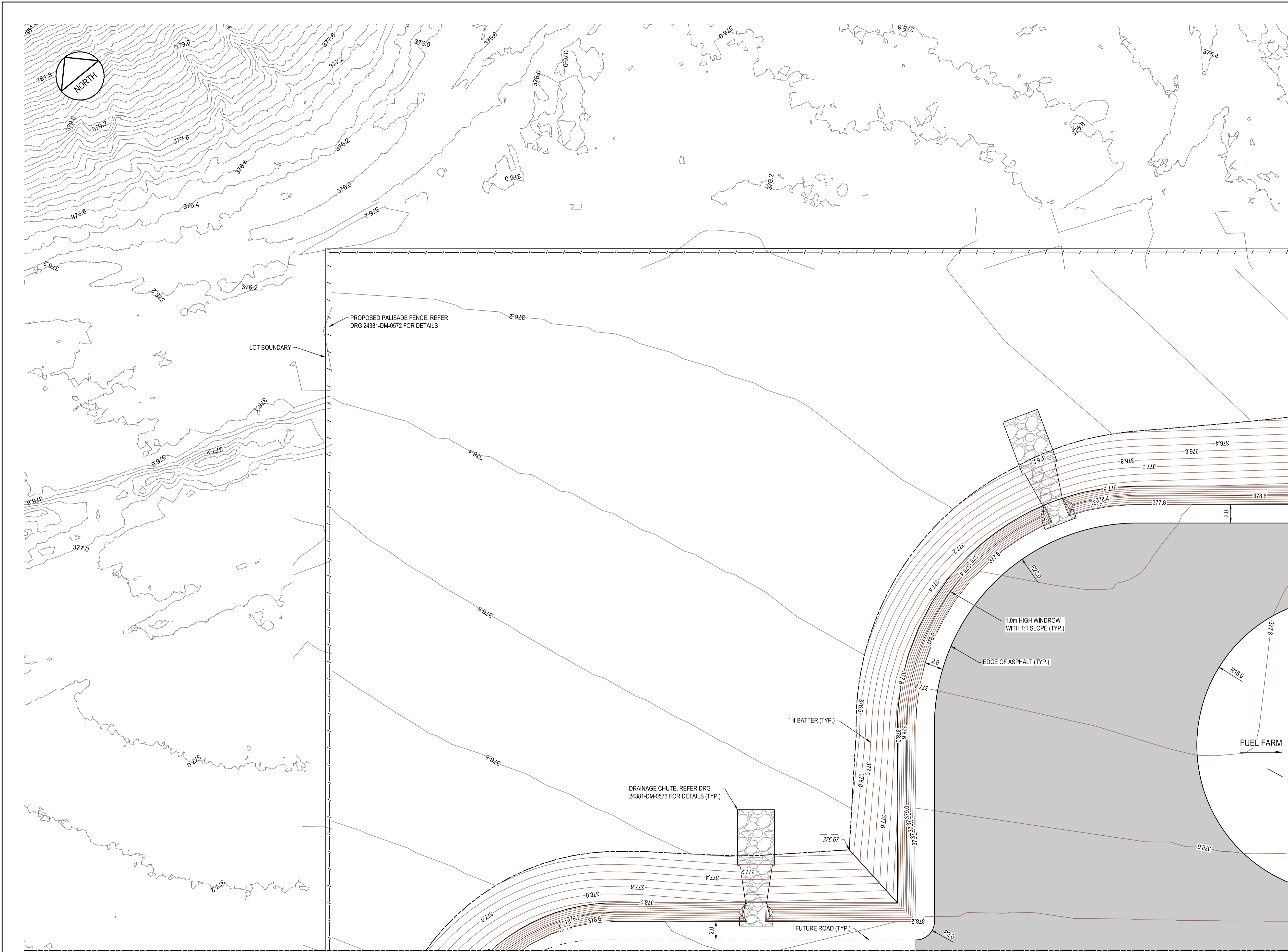


Greg Hookey
Principal Hydrologist

References

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Appendix A Final earthworks drawing



KEY PLAN

NOTES

1. REFER DRAWING 24381-DM-0501 FOR NOTES.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN METRES U.S.O.

LEGEND

- FINISHED SURFACE CONTOURS
- EXISTING CONTOURS
- PAD R.L.
- DESIGN GRADE
- DESIGN LEVEL
- EXISTING LEVEL
- BATTER INTERFACE
- EXISTING PAVEMENT
- PROPOSED HV ASPHALT
- PROPOSED LV ASPHALT AND SKIRTING
- PROPOSED UNSEALED HARDSTAND

MATCHLINE - REFER DRG 2481-DM-0521

PRELIMINARY



SCALE 1:200

MATCHLINE - REFER DRG 2481-DM-0523

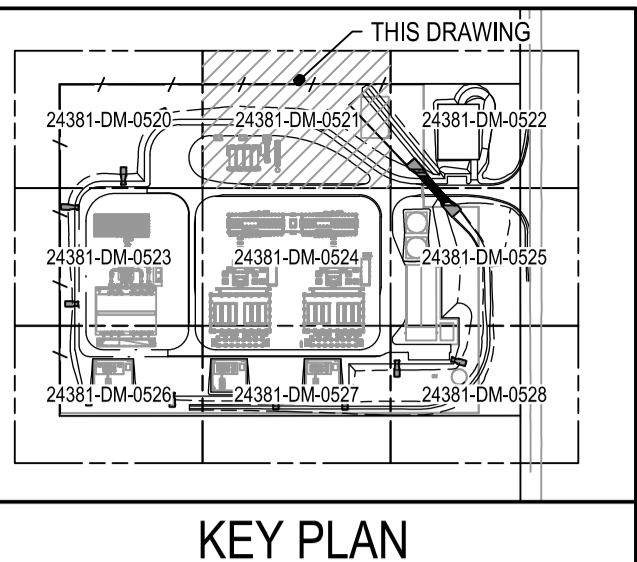
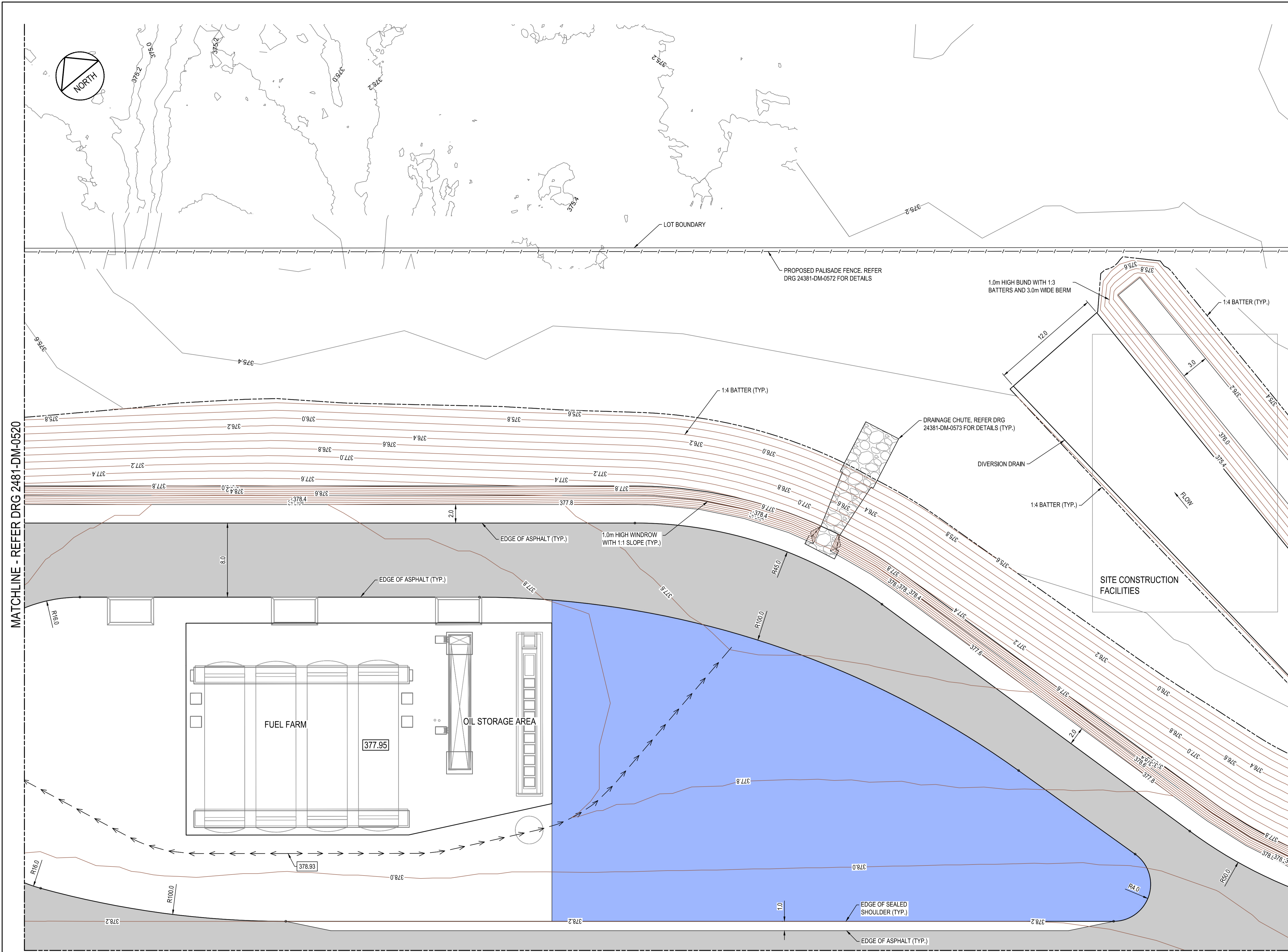
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OCTOBER / 2025	MFC	MFC	KJ
GIRD	APPROVED	DATUM	
MGA2020	PS	AHD	
ZENITH	SCALE U.N.D.	SHEET SIZE	DRG No.
113-DM-0520	1:200	A1	24381-DM-0520

CLIENT & JOB	REVISION
ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION	A
TITLE	
FINISHED SURFACE AND DRAINAGE PLAN - SHEET 1	



- NOTES**
- REFER DRAWING 24381-DM-0501 FOR NOTES.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
 - ALL DIMENSIONS ARE IN METRES U.S.O.

- LEGEND**
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 - 377.0 EXISTING CONTOURS
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 - 3% DESIGN GRADE
 - 377.80 DESIGN LEVEL
 - 377.80 EXISTING LEVEL
 - BATTER INTERFACE
 - GRADED DRAIN
 - EXISTING PAVEMENT
 - PROPOSED HV ASPHALT
 - PROPOSED LV ASPHALT AND SKIRTING
 - PROPOSED UNSEALED HARDSTAND

PRELIMINARY



REV	DATE	DESCRIPTION	BY	CHKR	REV	DATE	DESCRIPTION	BY	CHKR
A	XX/XX/25	ISSUED FOR CLIENT REVIEW	MFC	KJ					

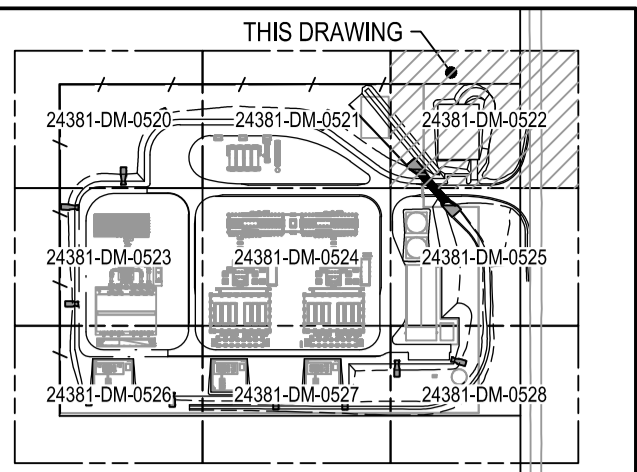
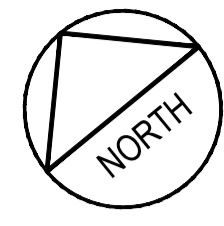
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GRI	APPROVED	DATUM	
MGA2020	PS	AHD	
ZENITH	SCALE U.N.I.T.	SHEET SIZE	DRG No.
113-DM-0521	1:200	A1	24381-DM-0521

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 2
REVISION	A

SCALE 1:200



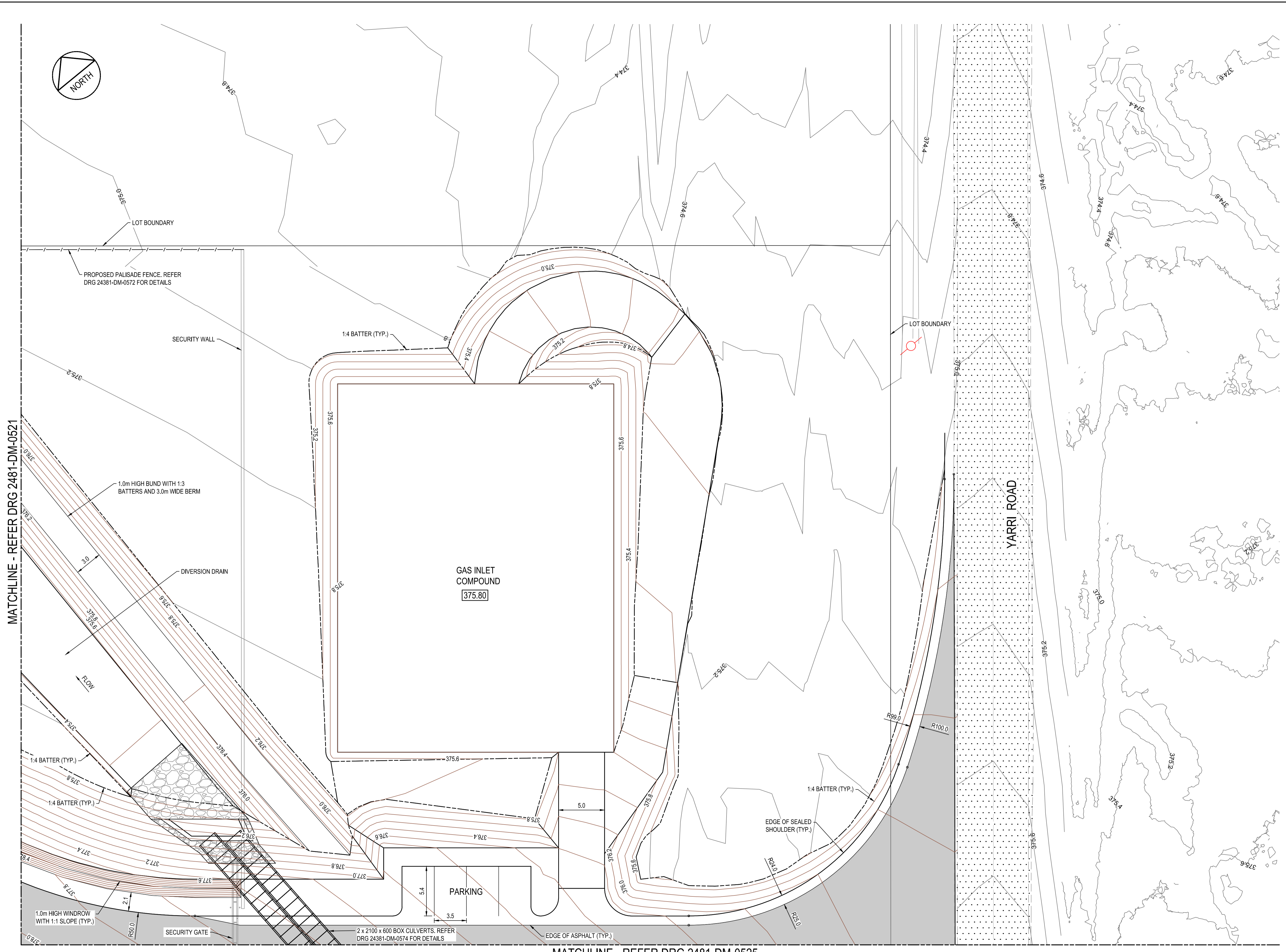
KEY PLAN

NOTES

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3. ALL DIMENSIONS ARE IN METRES U.S.O.

LEGEND

- FINISHED SURFACE CONTOURS
- EXISTING CONTOURS
- PAD R.L.
- DESIGN GRADE
- DESIGN LEVEL
- EXISTING LEVEL
- BATTER INTERFACE
- GRADED DRAIN
- EXISTING PAVEMENT
- PROPOSED HV ASPHALT
- PROPOSED LV ASPHALT AND SKIRTING
- PROPOSED UNSEALED HARDSTAND



PRELIMINARY



SCALE 1:200

REV	DATE	DESCRIPTION	BY	CHKR	REV	DATE	DESCRIPTION	BY	CHKR
A	20/11/25	ISSUED FOR CLIENT REVIEW	MFC	KJ					

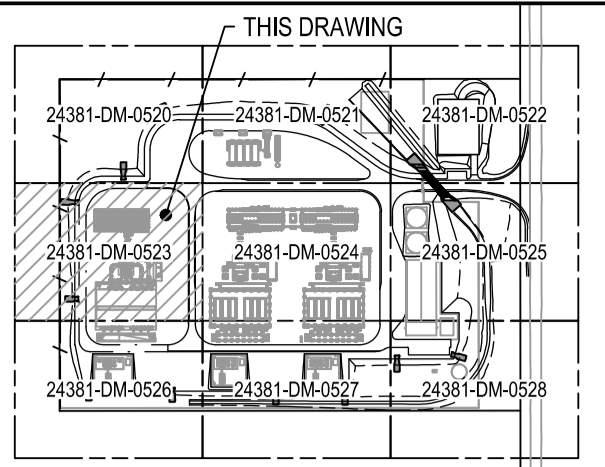
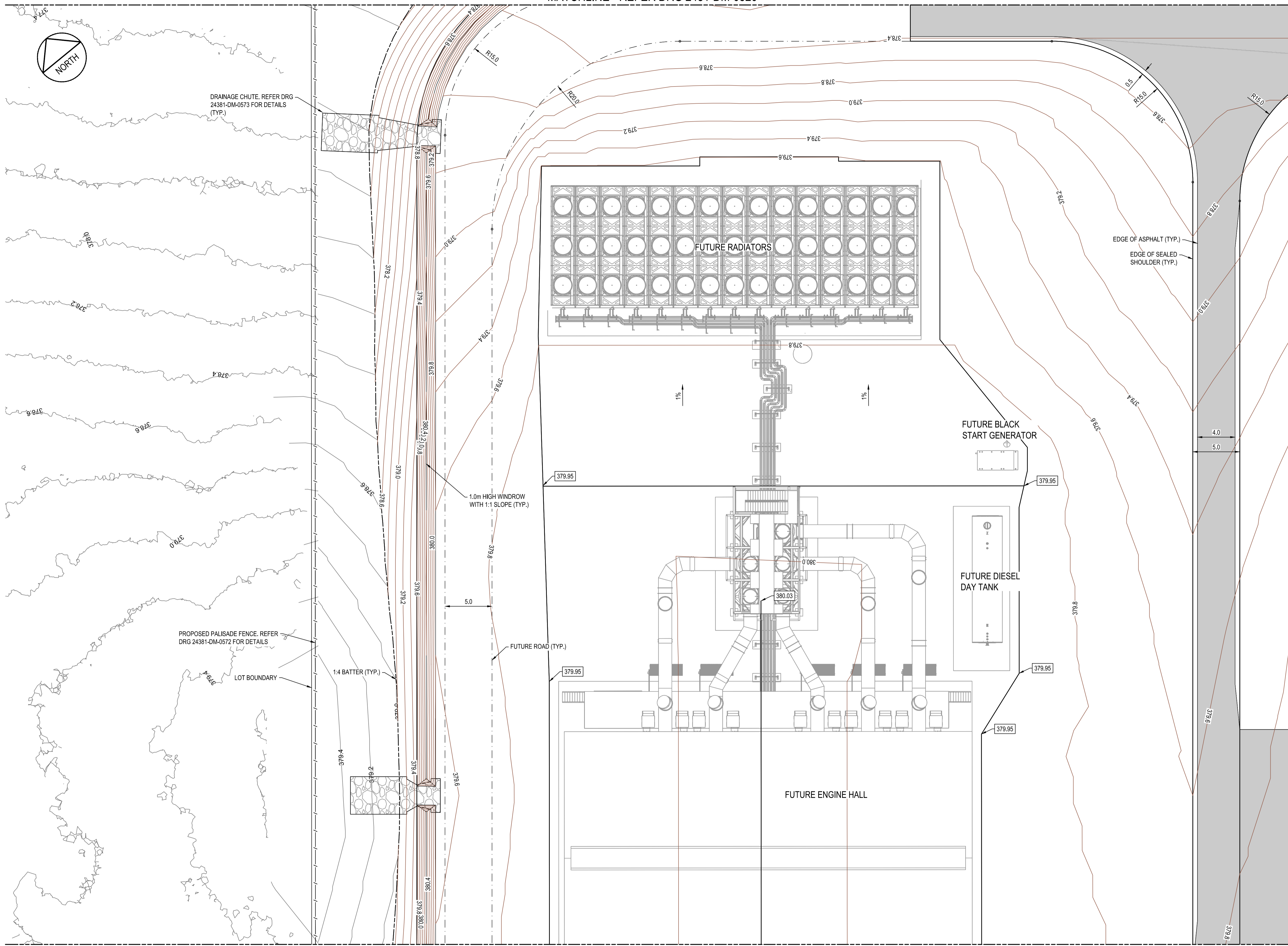
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GRI	APPROVED	DATUM	
MGA2020	PS	AHD	
ZENITH	SCALE U.N.D.	SHEET SIZE	DRG No.
113-DM-0522	1:200	@ A1	24381-DM-0522

CLIENT & JOB	REVISION
ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION	
TITLE	
FINISHED SURFACE AND DRAINAGE PLAN - SHEET 3	

MATCHLINE - REFER DRG 2481-DM-0520



KEY PLAN

NOTES

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3. ALL DIMENSIONS ARE IN METRES U.S.O.

LEGEND

- 377.0 FINISHED SURFACE CONTOURS
- 377.0 EXISTING CONTOURS
- 380.5 PAD R.L.
- 3% DESIGN GRADE
- 377.80 DESIGN LEVEL
- 377.80 EXISTING LEVEL
- BATTER INTERFACE
- GRADED DRAIN
- EXISTING PAVEMENT
- PROPOSED HV ASPHALT
- PROPOSED LV ASPHALT AND SKIRTING
- PROPOSED UNSEALED HARDSTAND

MATCHLINE - REFER DRG 2481-DM-0524

MATCHLINE - REFER DRG 2481-DM-0526

PRELIMINARY



Zero Damage - Zero Harm

SCALE 1:200 0m 4m 8m

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A	20/11/25	ISSUED FOR CLIENT REVIEW	MFC	KJ					

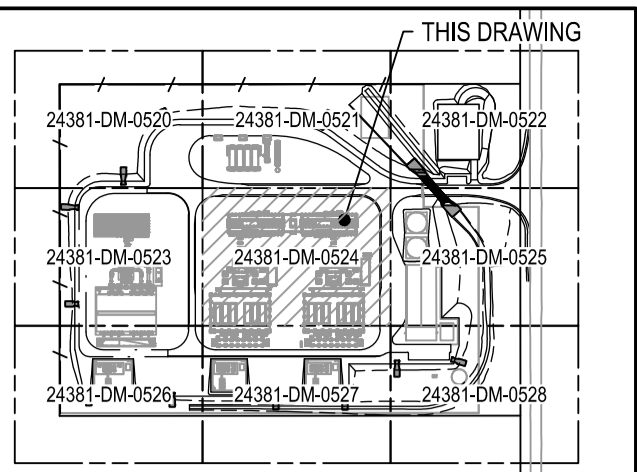
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DATE	APPROVED	DATUM	
	PS	AHD	
ZENITH	SCALE U.N.D.	SHEET SIZE	DRG No.
113-DM-0523	1:200	@ A1	24381-DM-0523

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 4
REVISION	A

MATCHLINE - REFER DRG 2481-DM-0521



KEY PLAN

NOTES

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LEGEND

- 377.0 FINISHED SURFACE CONTOURS
- 377.0 EXISTING CONTOURS
- 380.5 PAD R.L.
- 3% DESIGN GRADE
- 377.80 DESIGN LEVEL
- 377.80 EXISTING LEVEL
- BATTER INTERFACE
- GRADED DRAIN
- EXISTING PAVEMENT
- PROPOSED HV ASPHALT
- PROPOSED LV ASPHALT AND SKIRTING
- PROPOSED UNSEALED HARDSTAND

MATCHLINE - REFER DRG 2481-DM-0523

MATCHLINE - REFER DRG 2481-DM-0525

MATCHLINE - REFER DRG 2481-DM-0527

PRELIMINARY



SCALE 1:200

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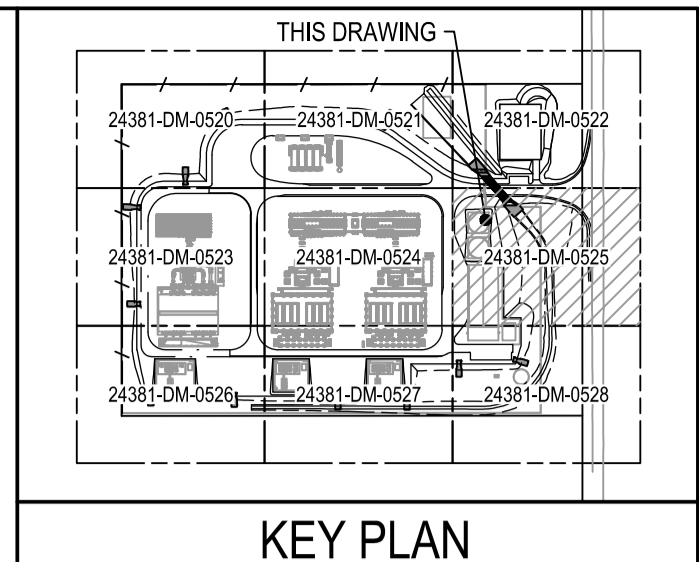
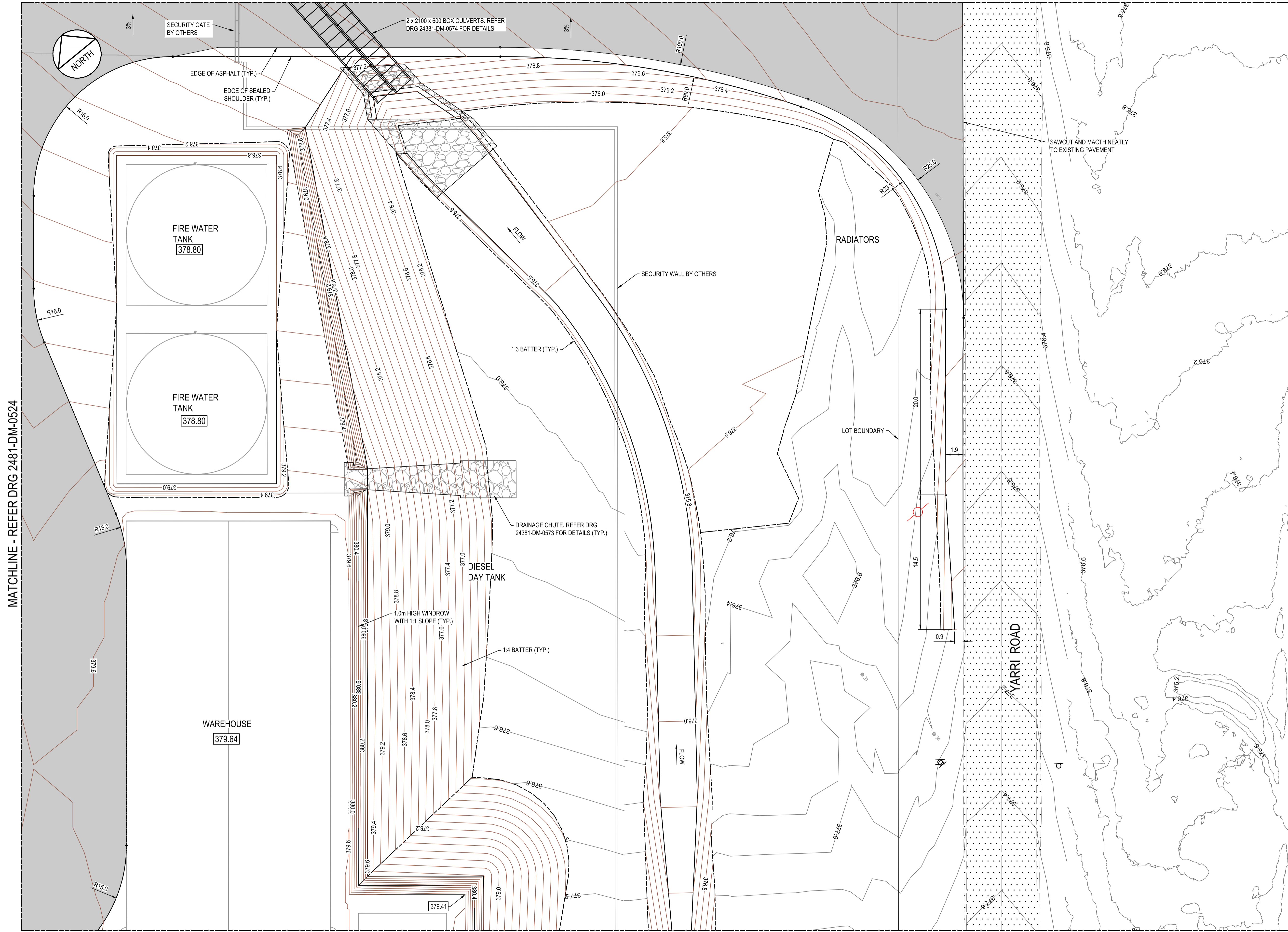
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GRIE	APPROVED	DATUM	
MGA2020	PS	AHD	
ZENITH	SCALE U.N.D.	SHEET SIZE	DRG No.
113-DM-0524	1:200	@ A1	24381-DM-0524

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 5
REVISION	A

MATCHLINE - REFER DRG 2481-DM-0522



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- LEGEND**
- 377.0 FINISHED SURFACE CONTOURS
 - 377.0 EXISTING CONTOURS
 - 380.5 PAD R.L.
 - 3% DESIGN GRADE
 - 377.80 DESIGN LEVEL
 - 377.80 EXISTING LEVEL
 - BATTER INTERFACE
 - GRADED DRAIN
 - EXISTING PAVEMENT
 - PROPOSED HV ASPHALT
 - PROPOSED LV ASPHALT AND SKIRTING
 - PROPOSED UNSEALED HARDSTAND

PRELIMINARY



SCALE 1:200

MATCHLINE - REFER DRG 2481-DM-0528

MATCHLINE - REFER DRG 2481-DM-0524

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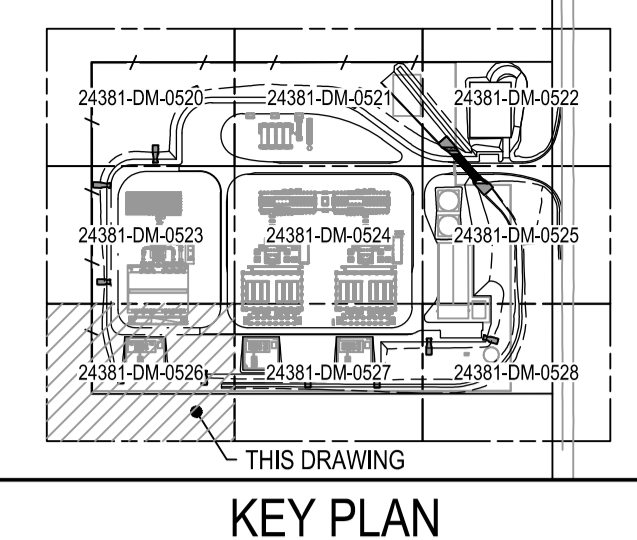
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GIRI	APPROVED	DATUM	
MGA2020	PS	AHD	
ZENITH	SCALE U.N.D.	SHEET SIZE	DRG No.
113-DM-0525	1:200	@ A1	24381-DM-0525

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 6
REVISION	A

MATCHLINE - REFER DRG 2481-DM-0523



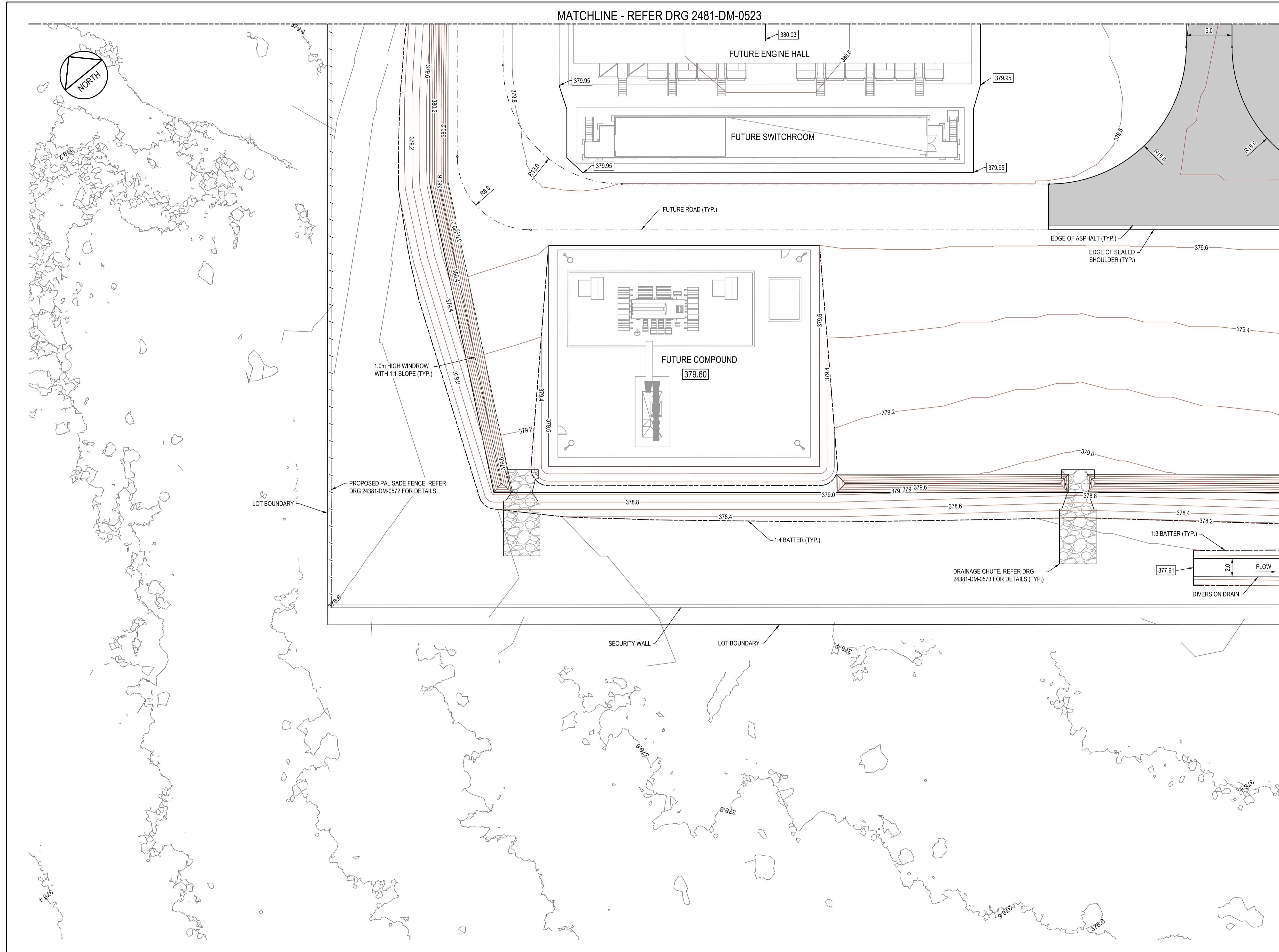
NOTES

1. REFER DRAWING 24381-DM-0501 FOR NOTES.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN METRES U.S.O.

LEGEND

- 377.0 FINISHED SURFACE CONTOURS
- 377.0 EXISTING CONTOURS
- 380.5 PAD R.L.
- 3% DESIGN GRADE
- 377.80 DESIGN LEVEL
- 377.80 EXISTING LEVEL
- BATTER INTERFACE
- GRADED DRAIN
- EXISTING PAVEMENT
- PROPOSED HV ASPHALT
- PROPOSED LV ASPHALT AND SKIRTING
- PROPOSED UNSEALED HARDSTAND

MATCHLINE - REFER DRG 2481-DM-0527



PRELIMINARY



SCALE 1:200

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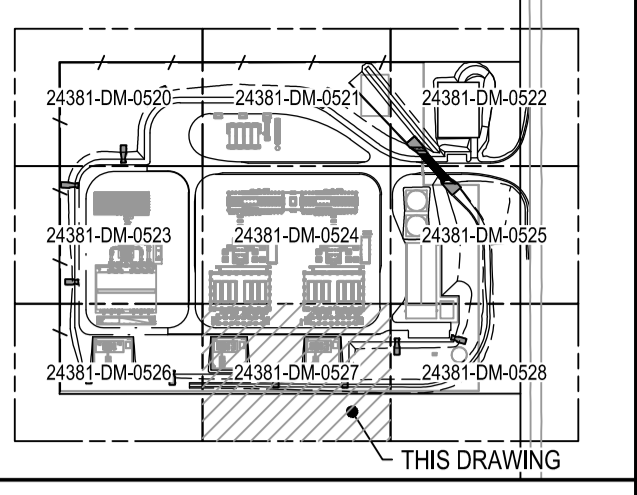
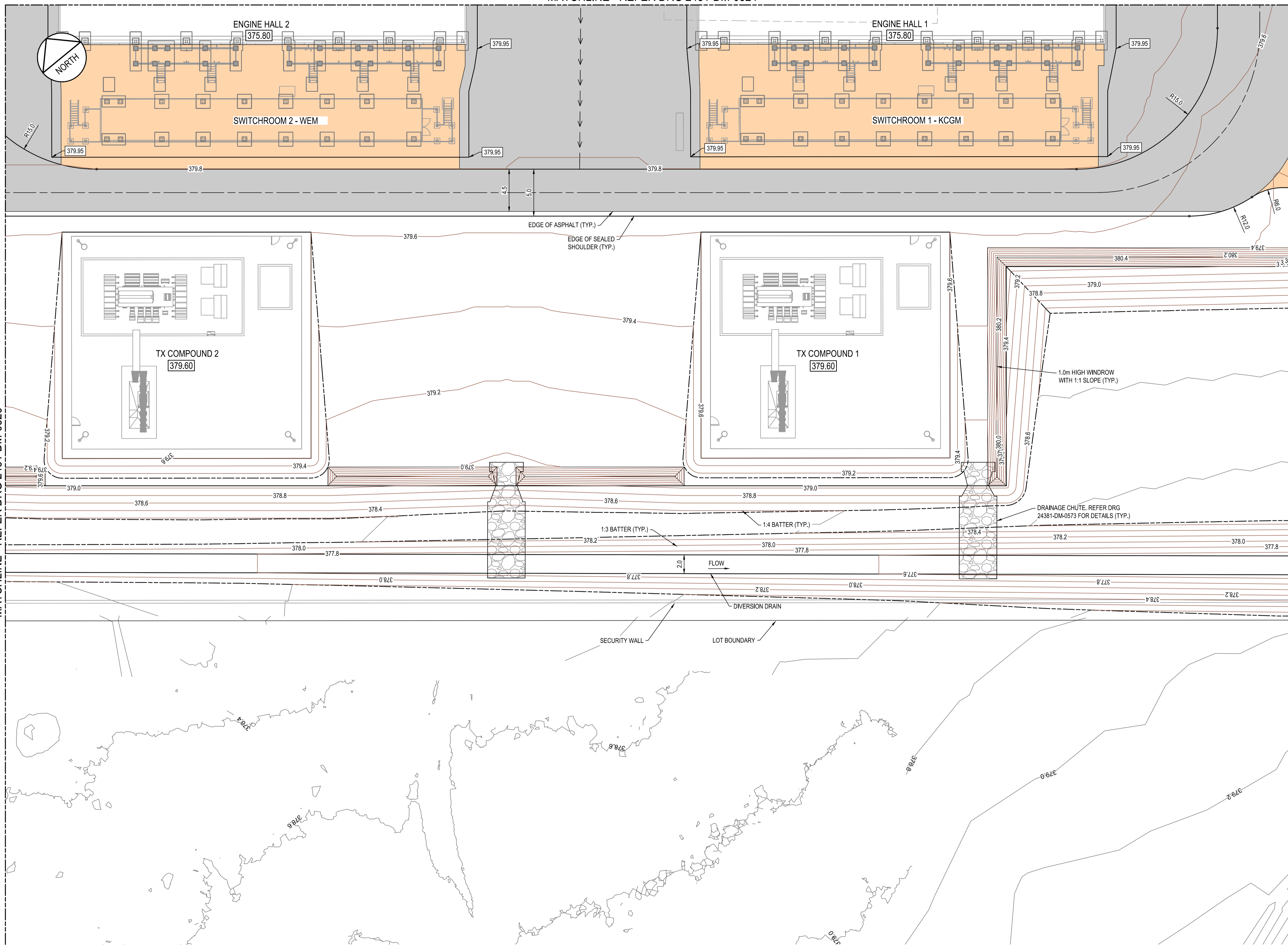
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OCTOBER / 2025	MFC	MFC	KJ
GRIE	APPROVED	DATUM	AHD
MGA2020	PS		
ZENITH	SCALE U.N.D.	SHEET SIZE	DRG No.
113-DM-0526	1:200	A1	24381-DM-0526

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 7
REVISION	A

MATCHLINE - REFER DRG 2481-DM-0524



KEY PLAN

NOTES

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LEGEND

- 377.0 FINISHED SURFACE CONTOURS
- 377.0 EXISTING CONTOURS
- 380.5 PAD R.L.
- 3% DESIGN GRADE
- 377.80 DESIGN LEVEL
- 377.80 EXISTING LEVEL
- BATTER INTERFACE
- GRADED DRAIN
- EXISTING PAVEMENT
- PROPOSED HV ASPHALT
- PROPOSED LV ASPHALT AND SKIRTING
- PROPOSED UNSEALED HARDSTAND

MATCHLINE - REFER DRG 2481-DM-0526

MATCHLINE - REFER DRG 2481-DM-0528

PRELIMINARY



SCALE 1:200

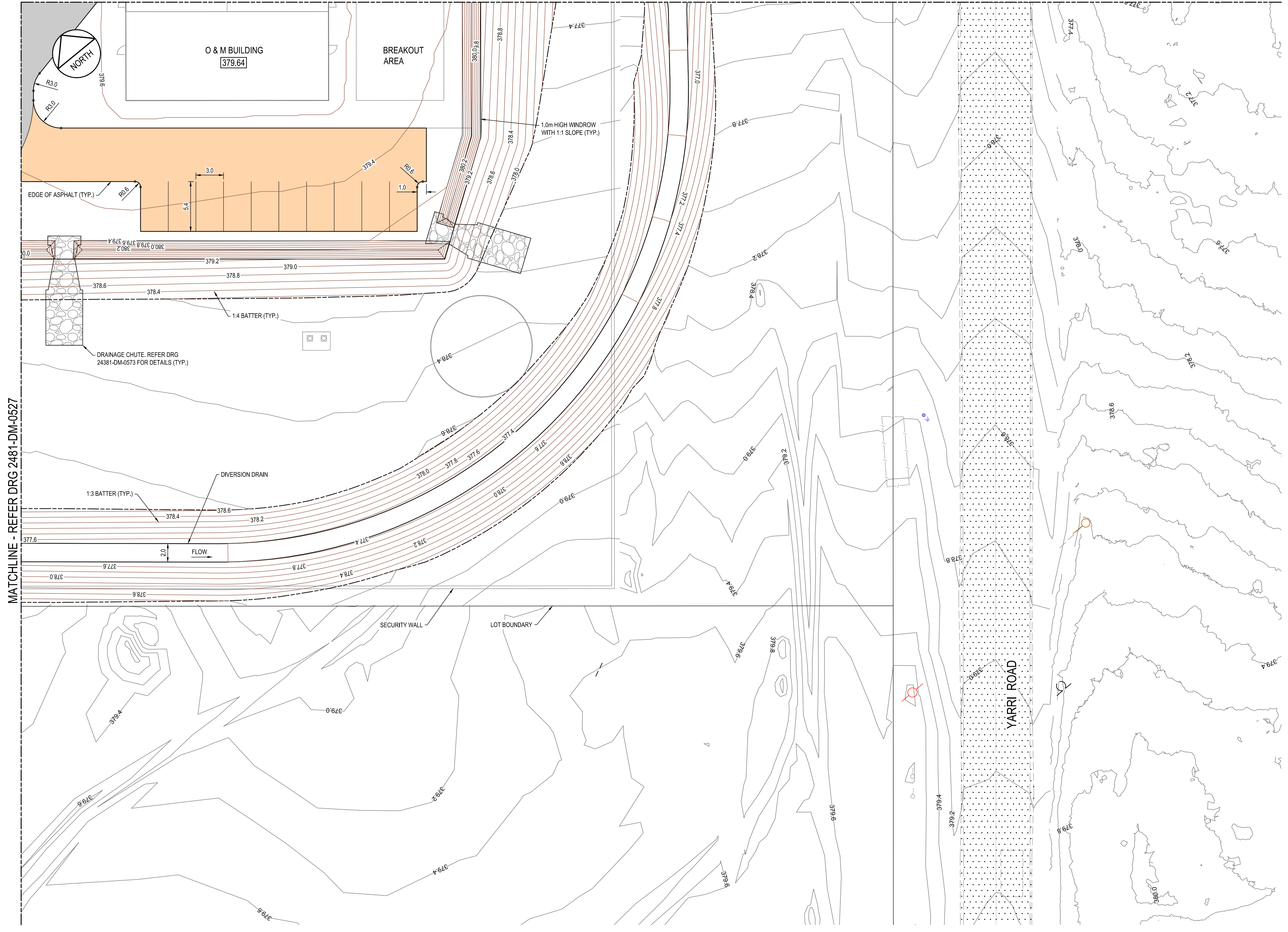
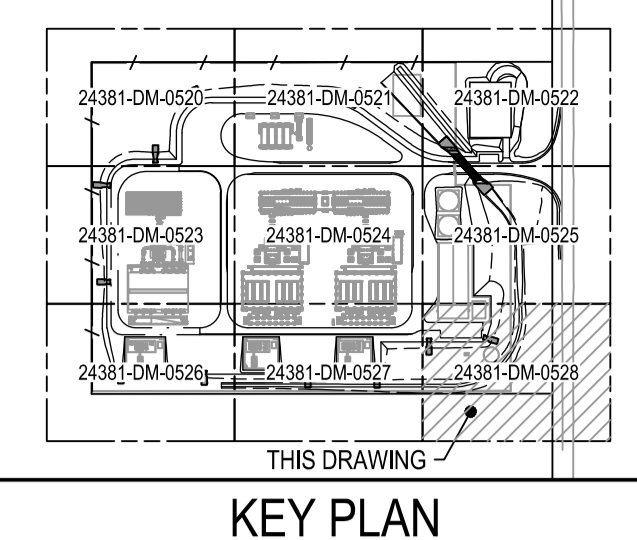
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A	20/11/25	ISSUED FOR CLIENT REVIEW	MFC	KJ					

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OCTOBER / 2025	MFC	MFC	KJ
GRID	DATE	DATUM	
MGA2020	AHD		
APPROVED	SCALE U.N.D.	SHEET SIZE	DRG No.
PS	1:200	A1	24381-DM-0527
ZENITH			
113-DM-0527			

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 8
SHEET SIZE	A1
DRG No.	24381-DM-0527
REVISION	A



- NOTES**
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LEGEND

	FINISHED SURFACE CONTOURS
	EXISTING CONTOURS
	PAD R.L.
	DESIGN GRADE
	DESIGN LEVEL
	EXISTING LEVEL
	BATTER INTERFACE
	GRADED DRAIN
	EXISTING PAVEMENT
	PROPOSED HV ASPHALT
	PROPOSED LV ASPHALT AND SKIRTING
	PROPOSED UNSEALED HARDSTAND

MATCHLINE - REFER DRG 2481-DM-0527

PRELIMINARY



SCALE 1:200

REV	DATE	DESCRIPTION	BY	CHKD	REV	DATE	DESCRIPTION	BY	CHKD
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DATE	OCTOBER / 2025	GRID	MGA2020	DATUM	AHD
DESIGNED	MFC	DRAWN	MFC	CHECKED	KJ
APPROVED	PS				
ZENITH	113-DM-0528	SCALE U.N.D.	1:200	SHEET SIZE	A1

CLIENT & JOB	ZENITH ENERGY OPERATIONS PTY LTD KCGM - THERMAL POWER STATION
TITLE	FINISHED SURFACE AND DRAINAGE PLAN - SHEET 9
SHEET NO.	24381-DM-0528
REVISION	A

Appendix B Flood inundation maps

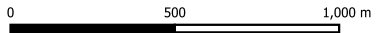
LEGEND

- Railway Lines
- Main Roads
- Proposed Thermal Power Station
- Catchment area

Flood depth (m)

- 0.02 - 0.20
- 0.20 - 0.50
- 0.50 - 1.00
- > 1.00 m flood depth color swatch"/> > 1.00

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
 Universal Transverse Mercator (UTM)

Project: KCGM Thermal Power Station Hydrological Assessment

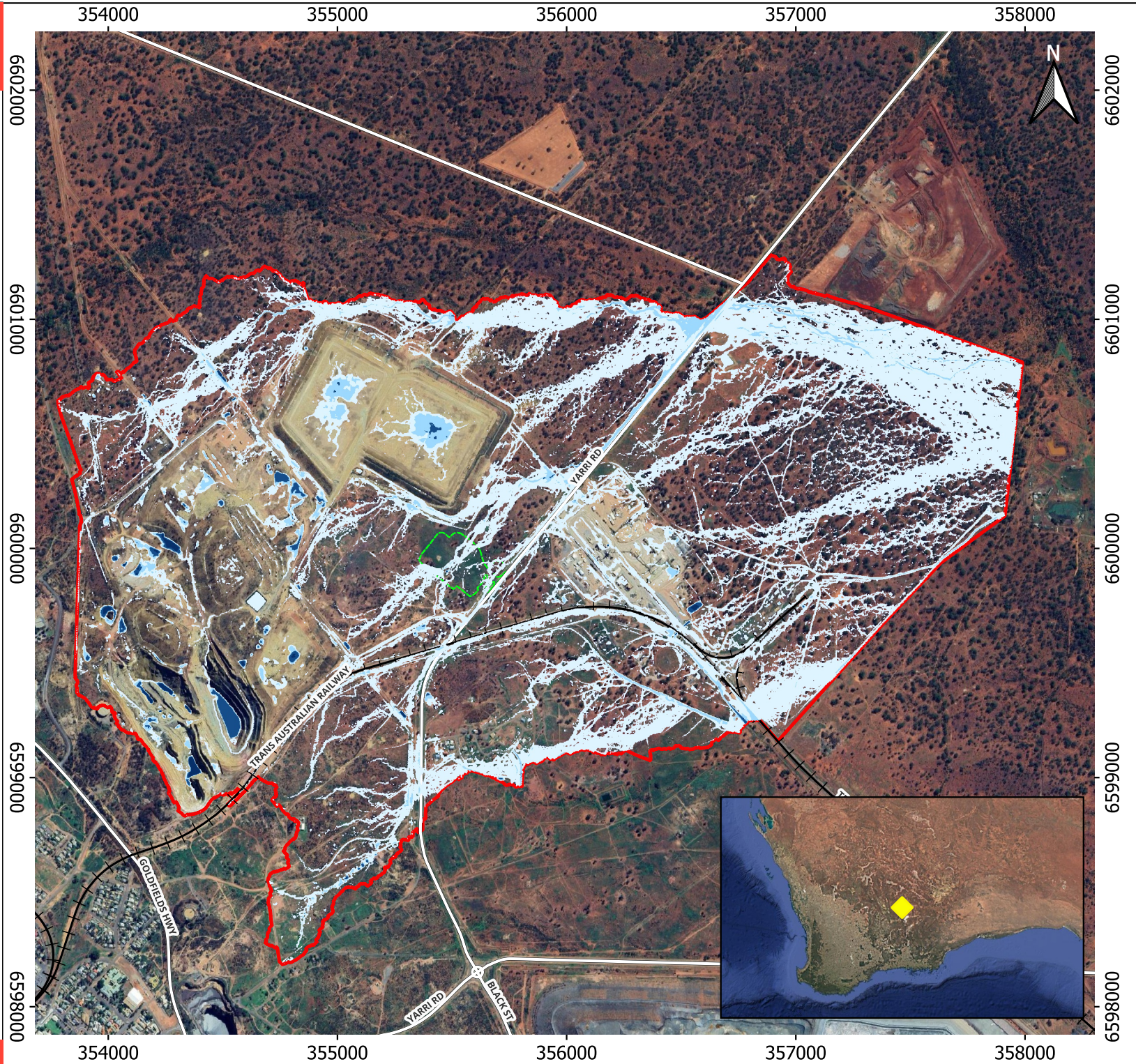
Client: Northern Star Resources Limited

Title: Maximum flood depth - Pre-development scenario, 1:100 AEP, 6-Hour flood event

Version: Final
 Project No: PS227418
 Rev: 0
 Figure No: B1

Designed: ES
 Prepared: ES
 Reviewed: HD
 Approved: GH
 Date: 04/12/2025

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LEGEND

⚡⚡ Railway Lines

— Main Roads

▭ Proposed Thermal Power Station

▭ Catchment area

Flood depth (m)

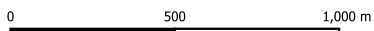
0.02 - 0.20

0.20 - 0.50

0.50 - 1.00

> 1.00

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
Universal Transverse Mercator (UTM)

Project: KCGM Thermal Power Station Hydrological Assessment

Client: Northern Star Resources Limited

Title: Maximum flood depth - Post-development scenario with diversion channel, 1:100 AEP, 6-Hour flood event

Version: Final
Project No: PS227418
Rev: 0
Figure No: B2

Designed: ES
Prepared: ES
Reviewed: HD
Approved: GH
Date: 04/12/2025

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Appendix C Flood level difference map

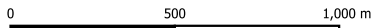
LEGEND

- Railway Lines
- Main Roads
- Proposed Thermal Power Station
- Catchment area

Flood level difference (m)

- ≤ -0.20
- $-0.20 - -0.02$
- $0.02 - 0.20$
- > 0.20

Aerial imagery sourced from Google Satellite online



GDA94 / MGA zone 51 EPSG:28351
 Universal Transverse Mercator (UTM)

Project: KCGM Thermal Power Station Hydrological Assessment

Client: Northern Star Resources Limited

Title: Difference in flood levels post-development
 subtracted from pre-development case, 1:100 AEP,
 6-Hour flood event

Version: Final
 Project No: PS227418
 Rev: 0
 Figure No: C1

Designed: ES
 Prepared: ES
 Reviewed: HD
 Approved: GH
 Date: 04/12/2025

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Appendix D Statement of limitations



Limitation Statement

This Report is provided by WSP Australia Pty Limited (*WSP*) for Northern Star Resources (Ltd) (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 21/08/2025 and agreement with the Client dated 28/08/2025 (*Agreement*).

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