

Memorandum

To: SCL File No: 423022-m-e-c004.docx
Attention: WBOPDC
From: Stephen Bos
Date: 31 May 2023
Subject: Tinex Group Ltd – 245 Te Puna Station Road –
Existing Site Usage - Stormwater Queries

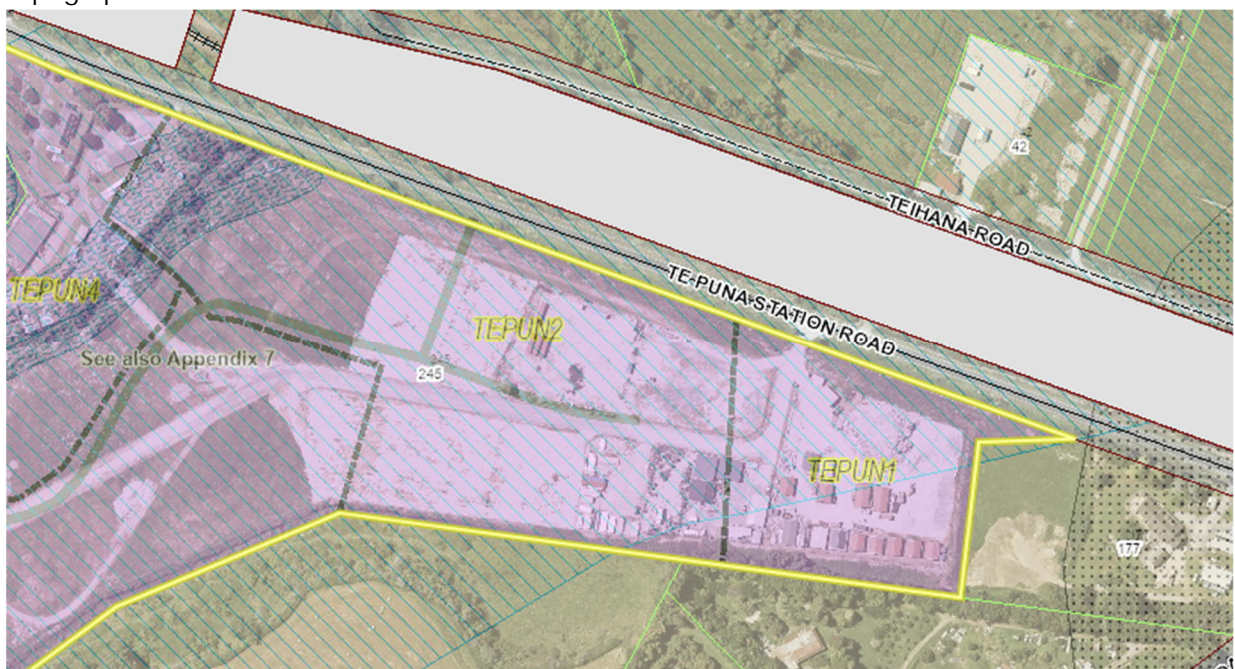
Further to the WBOPDC RFI and meeting the following response is provided in terms of the relevant stormwater queries:

STORMWATER MANAGEMENT

1. The stormwater assessment provided is lacking in technical evidence. Please provide:
 - a) calculations to demonstrate that the stormwater impact from the current users on the overall catchment is minimal.
 - b) Topographic Plans showing the existing land contours/spot heights, and overland flow paths.
 - c) Additional information that further qualifies the statement that *"from the discharge location, the flows disperse across the full site area such that mitigation of the additional flow is considered to occur prior to exiting the individual yard site"*.

Stormwater Management Response

The site is currently zoned Industrial, and the site lies within the Te Puna Industrial Park, with layout as below. A detailed site survey of the area is attached to this response that shows the layout and topographical details of the site.



Also now included is the identification of the site falls, with noted bunding to the south, east and part north. The existing overland flow paths are shown and there is a series of drains, minor culverts and discharge points that collect the site flow and run this to the existing main drain along the south side of Te Puna Station Road.

The site has been formed and used in its current state for a number of years, as per the 2019 aerial noted below



Under the WBOPDC District Plan for Industrial land, storage is a permitted activity subject to Structure Plan requirements being met.

The baseline assessment for all discharges from the site is acceptance that the site is zoned Industrial and is fully metalled, such that stormwater can be discharged off the site from a cleared and paved site.

It is acknowledged that there are a number of issues associated with the greater catchment and stormwater discharges within the catchments are being reviewed and specifically addressed by the stormwater modelling consultant (Dr Steve Joynes). The intention of this response is not to address the larger catchment issues but to confirm that the ongoing internal site activities have no greater effect than the baseline permitted activity status, (ie the effect of the current off-site flows from the site generated activities are not creating a greater impact that what would be permitted under a permitted activity).

From the larger catchment modelling results the physical location of the site (towards the lower end

of the catchment) and the singular effect of the runoff generated from the base site is not considered to be the primary cause of flooding or noted stormwater issues within the catchment. In addition, further modelling works are currently underway to identify potential remedial works that result in the upstream water levels being lowered to ensure the level of effects on all parties are minimised and remain as the Structure Plan Baseline Intends.

With regards to the current site activities we confirm as follows:

The overall land area of the subject site is noted as 12.2 ha, of which currently 3.8 ha is metalled.

The balance of the site is currently in grass and pasture with access tracks across the site.

Within the 3.85 ha, site activities are underway that generally involve either open stockpiling of material, temporary storage of materials including fibreglass swimming pools, containers and the like and temporary storage of relocatable houses.

No specifically designed drainage systems has been installed within the site (to service the site storage areas), although there is a series of water table drains and minor culverts crossings throughout the site with allow vehicle access to the storage yard areas. The layout of the existing drainage pipes and water table drains is shown on the attached plan. All internal site flows generally pass to the north and either discharge through pipes installed through the main northern site bund, or around the main vehicle entrance where the water tables are formed to drop into the existing main road drain.

Site operations are such that all roof and hard surface area discharge directly onto the ground directly adjacent the particular storage unit/house roof, and from this point the water tracks as surface water to reach the existing drainage features.

A previous statement has been made that site mitigation of the existing site flow is provided by utilisation of the flat grades across site and the sheet flow effect of discharging to ground as opposed to conveying the flows in a piped system and discharging this directly to the outfall at the boundary. This is further expanded as:

- Through past site activities, in isolation and not considering the filling undertaken to raise the site, the site area currently being used for industrial storage activities has been metalled and is predominantly 'flat'. Grades in the order of 0.25% are noted (as per the attached survey plan).
- The expected runoff coefficient from the site is taken as 0.5 as per NZBC E1 / VM 1 tables 1 and 2

Developed surface types	
Fully roofed and/or sealed developments	0.90
Steel and non-absorbent roof surfaces	0.90
Asphalt and concrete paved surfaces	0.85
Near flat and slightly absorbent roof surfaces	0.80
Stone, brick and precast concrete paving panels	
– with sealed joints	0.80
– with open joints	0.60
Unsealed roads	0.50
Railway and unsealed yards and similar surfaces	0.35

Table 2: Slope Correction for Run-off Coefficients Paragraph 2.1.3		
Ground slope Adjust C by:		
0-5%	subtracting	0.05
5-10%	no adjustment	
10-20%	adding	0.05
20% or steeper	adding	0.10

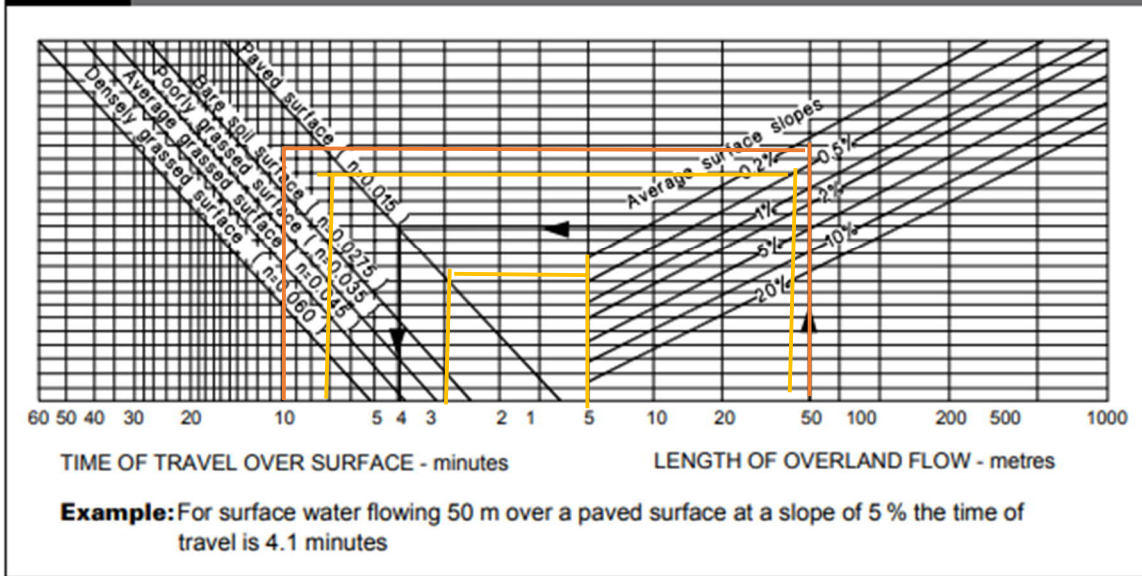
-
- The site usage is noted as storage with all activities discharging onto ground where they flow overland to a drainage outfall point.
- Clause 2.3 of NZBC E1 notes that the time of concentration for stormwater to enter the system (in this case the site outfall) is taken as $T_{\text{entry}} + T_{\text{flow}}$
- Clause 2.3.2 a) is identified as 5 minutes as per the description below
The time of entry t_e :
 - Where the catchment area has a well defined and regularly repeated pattern for directing the *surface water* to the *drain* or open channel, the time of entry may be taken as:

$t_e = 5$ minutes for commercial or industrial areas where greater than 50% of the surface of the catchment area feeding the *drain* or open channel consists of roofed, asphalt, concrete, paved or metallised surfaces.
-

As per the attached marked up plan the time of overland flow is considered to vary from the areas closest to the outfall to those furthest away. It is considered that the existing seal yard and flow path runs have been set up to match actual site activities, however these are also considered to be reflective of the site should no activities be undertaken and the yard be sealed only. It is reasonable to assume that water table drains would be formed across the site to enable the collection and discharge of surface water landing on the site.

Based on a generalised distance of 50m run from the centre of the site to the nearest drain outlet the minimum time of flow is considered to be around 10 minutes as per the extract from the graph below.

Figure 1: Times for Overland Flow
Paragraph 2.3.2 b) i)



The baseline time of concentration is therefore considered to be in the order of 15 minutes. Based on a reassessment of 5m of paved flow (roof or hard paved object) and then 45m of metallised surface flow the reviewed TOC would be $5 + 3 + 7 = 15$ minutes or equivalent to the baseline.

Further an overall check of the runoff coefficient considered that compared to the full site development at a paved coefficient of 0.5 vs the current site usage with a minor component at 0.9 runoff the gross runoff factor does not change and the effective increase is 0.04% which is less than minor.

In terms of WBOPDC policy for stormwater improvement, we note that the works applied for under this consent are the temporary works to enable the existing site to continue as current. There is a full consent application underway to provide for the final site development and this addresses stormwater control and mitigation with the introduction of swales, ponds and filter systems that provide both stormwater treatment and retention. The effects of the current application are neither mitigated or exacerbated and are requested to continue while the new application is under process.

In summary as per the methodology outlined above, as there is no fully piped stormwater system within the site, all runoff from the site users (stored buildings / pools and vehicles etc) is considered to outflow onto ground and then via overland flow to open water table drains to then discharge at the site boundary in the locations as noted. Based on the permitted baseline of a metallised surface for the industrial site there is no expectation of a faster or greater runoff with the site activities as currently occurring.

We trust this suitably responds to the queries raised. Please contact the undersigned if you have any further queries.

Yours faithfully

STRATUM CONSULTANTS LTD



Stephen Bos

CPEng, CEngNZ, BE(hons), NZCE (civil/Struct)

Job Title Tinex Group
Site Address 245 Te Puna Station Road
City Te Puna
Job No. 423022

Page
No of Pages
Date May 23
By SB

TGA REV 2 - 07/07/2010



Stormwater Catchment Data

Existing Site Area = 122126 m²

Existing runoff coeff 0.5

Rainfall Intensities mm/hr HIRDS V4

Return	Duration (minutes)						
Period	10	20	30	60	120	360	720
10	124.0	97.0	82.5	60.7	42.6	22.1	13.9
50	180.0	139.0	118.0	86.5	60.4	31.2	19.4
100	206.0	158.0	135.0	98.6	68.7	35.4	22.0

Existing Site Discharge (Q = CIA) l/s

Return	Duration (minutes)						
Period	10	20	30	60	120	360	720
10	2103	1645	1399	1030	723	375	236
50	3053	2358	2002	1467	1025	529	329
100	3494	2680	2290	1672	1165	600	373

Developed Site Discharge (Q = CIA) l/s

Return	Duration (minutes)						
Period	10	20	30	60	120	360	720
10	2104	1646	1400	1030	723	375	236
50	3054	2359	2002	1468	1025	529	329
100	3495	2681	2291	1673	1166	601	373

% Change 0.04%

Revised runoff coeff

Runoff

coeff Total

Site Full (less hardstand change) 119876 0.5 59938
 hardstand change 1275 0.9 1147.5

TOTAL 61085.5

Average runoff coeff = **0.500**

HIRDS V4 Intensity-Duration-Frequency Results

Sitename: Te Puna Station Road

Coordinate system: WGS84

Longitude: 176.0859

Latitude: -37.6855

DDF Model Parameter: c d e f g h i
 Values: -0.00449 0.540617 -0.03861 0 0.276136 -0.01076 3.247881
 Example: Duration (t ARI (yrs) x y Rainfall Rate (mm/hr)
 24 100 3.178054 4.600149 10.75094

Rainfall intensities (mm/hr) :: Historical Data

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	51.8	40.7	34.7	25.7	18.4	9.98	6.47	4.04	2.44	1.78	1.41	1.18
2	0.5	57.4	45	38.4	28.4	20.3	11	7.13	4.45	2.68	1.95	1.55	1.29
5	0.2	77.4	60.5	51.5	38	27	14.6	9.4	5.85	3.51	2.56	2.03	1.68
10	0.1	92.9	72.5	61.7	45.4	32.2	17.3	11.1	6.91	4.13	3.01	2.38	1.98
20	0.05	110	85.3	72.4	53.2	37.6	20.1	12.9	8.01	4.78	3.47	2.75	2.28
30	0.033	120	93.1	79	57.9	40.9	21.9	14	8.68	5.17	3.76	2.97	2.47
40	0.025	127	98.9	83.8	61.4	43.3	23.1	14.8	9.16	5.46	3.96	3.13	2.6
50	0.02	133	103	87.7	64.2	45.3	24.1	15.5	9.55	5.68	4.12	3.26	2.7
60	0.017	138	107	90.8	66.5	46.8	24.9	16	9.86	5.86	4.25	3.36	2.79
80	0.013	146	113	95.9	70.1	49.4	26.3	16.8	10.4	6.15	4.46	3.52	2.92
100	0.01	152	118	99.9	73	51.4	27.3	17.4	10.8	6.38	4.62	3.65	3.03
250	0.004	179	138	117	85.1	59.7	31.6	20.1	12.4	7.33	5.3	4.18	3.46

Rainfall intensities (mm/hr) :: RCP8.5 for the period 2031-2050

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	57	44.8	38.2	28.3	20.1	10.8	6.91	4.29	2.56	1.86	1.47	1.22
2	0.5	63.3	49.7	42.4	31.4	22.3	11.9	7.64	4.72	2.81	2.05	1.62	1.34
5	0.2	85.8	67.1	57.1	42.1	29.8	15.9	10.1	6.24	3.71	2.69	2.12	1.76
10	0.1	103	80.6	68.5	50.4	35.6	18.9	12	7.38	4.38	3.17	2.5	2.07
20	0.05	122	94.9	80.6	59.2	41.7	22	14	8.57	5.07	3.67	2.89	2.39
30	0.033	133	104	88	64.5	45.4	23.9	15.2	9.29	5.49	3.97	3.13	2.59
40	0.025	142	110	93.4	68.4	48.1	25.3	16.1	9.82	5.8	4.19	3.3	2.73
50	0.02	149	115	97.7	71.5	50.3	26.4	16.8	10.2	6.04	4.36	3.43	2.84
60	0.017	154	120	101	74.1	52	27.4	17.3	10.6	6.23	4.5	3.54	2.93
80	0.013	163	126	107	78.2	54.9	28.8	18.2	11.1	6.55	4.72	3.72	3.07
100	0.01	170	132	111	81.4	57.1	30	18.9	11.5	6.79	4.9	3.85	3.18

250	0.004	200	154	130	95	66.4	34.7	21.9	13.3	7.79	5.61	4.41	3.64
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Rainfall intensities (mm/hr) :: RCP8.5 for the period 2081-2100

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	67.6	53.1	45.4	33.6	23.7	12.4	7.81	4.78	2.8	2.01	1.59	1.31
2	0.5	75.4	59.2	50.5	37.4	26.4	13.8	8.69	5.27	3.1	2.23	1.76	1.45
5	0.2	103	80.5	68.6	50.6	35.6	18.5	11.6	7.03	4.11	2.96	2.32	1.92
10	0.1	124	97	82.5	60.7	42.6	22.1	13.9	8.35	4.88	3.51	2.75	2.27
20	0.05	147	115	97.2	71.4	50	25.9	16.2	9.71	5.67	4.07	3.19	2.62
30	0.033	161	125	106	78	54.5	28.2	17.6	10.5	6.15	4.41	3.45	2.84
40	0.025	171	133	113	82.6	57.8	29.9	18.6	11.2	6.48	4.66	3.64	3
50	0.02	180	139	118	86.5	60.4	31.2	19.4	11.6	6.76	4.84	3.79	3.12
60	0.017	186	145	122	89.6	62.6	32.3	20.1	12	6.98	5.01	3.91	3.22
80	0.013	197	153	130	94.7	66.1	34	21.1	12.6	7.35	5.26	4.11	3.38
100	0.01	206	159	135	98.6	68.7	35.4	22	13.1	7.62	5.45	4.26	3.5
250	0.004	242	187	158	115	79.9	41	25.4	15.1	8.74	6.24	4.88	4.01



SERVICES NOTE
 WHERE EXISTING SERVICES ARE SHOWN, THEY ARE INDICATIVE ONLY AND MAY NOT INCLUDE ALL GITE SERVICES. STRATUM CONSULTANTS LTD DOES NOT WARRANT THAT ALL OR INDEED ANY SERVICES ARE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE CONTRACT WORKS.



Lot 2
DP 22158
 RT SA22C/188
 12.2043ha

No.	Date	By	Issue/Revision
A	31.05.23	SB	FOR CONSENT

NOTES/KEY:

DRAWN:	MJH
CHECKED:	-
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

Tinex Group Ltd
245 Te Puna Station Road
Te Puna

Existing Site Plan
Lot 2 DP 22158

ORIGINAL DWG. SIZE A1
SCALE: 1:1000
DRAWING No. 423022-M-E-D002
SHEET No. 01
ISSUE A



SERVICES NOTE
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**Lot 2
 DP 22158
 RT SA22C/188
 12.2043ha**



No.	Date	By	Issue/Revision
A	31.05.23	SB	FOR CONSENT

NOTES/KEY:

DRAWN:	MJH
CHECKED:	-
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

**Tinex Group Ltd
 245 Te Puna Station Road
 Te Puna**

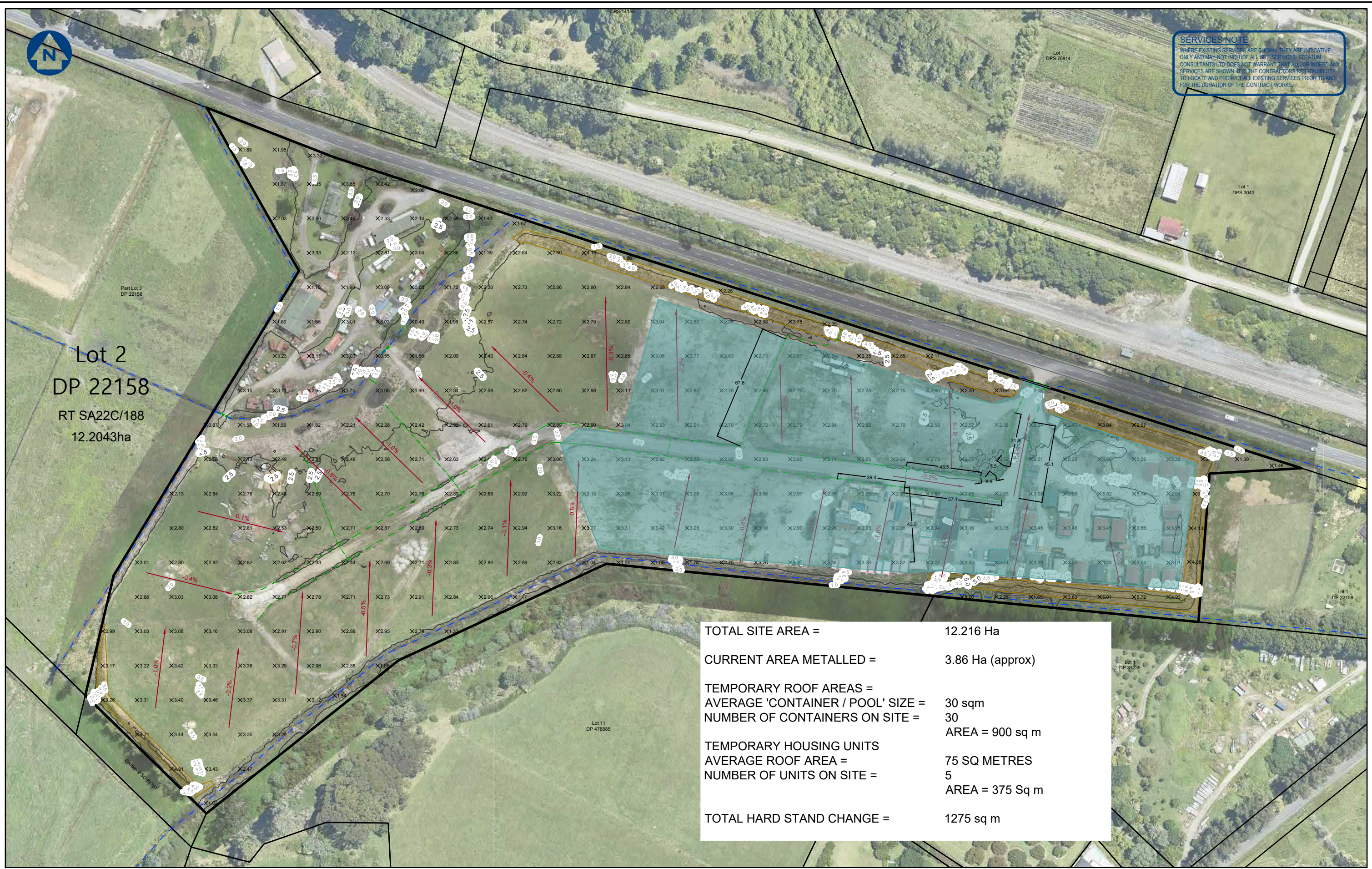
**Existing Site Plan
 Lot 2 DP 22158
 OVERLAND FLOW DIRECTIONS NOTED**

ORIGINAL DWG. SIZE A1
SCALE: 1:1000
DRAWING No. 423022-M-E-D002
SHEET No. 02 ISSUE A

Stratum CONSULTANTS
 Planners | Engineers | Surveyors



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Lot 2
DP 22158
 RT SA22C/188
 12.2043ha

TOTAL SITE AREA = 12.216 Ha
CURRENT AREA METALLED = 3.86 Ha (approx)
TEMPORARY ROOF AREAS =
AVERAGE 'CONTAINER / POOL' SIZE = 30 sqm
NUMBER OF CONTAINERS ON SITE = 30
AREA = 900 sq m
TEMPORARY HOUSING UNITS
AVERAGE ROOF AREA = 75 SQ METRES
NUMBER OF UNITS ON SITE = 5
AREA = 375 Sq m
TOTAL HARD STAND CHANGE = 1275 sq m

No.	Date	By	Issue/Revision
A	31.05.23	SB	FOR CONSENT

NOTES/KEY:

DRAWN:	MJH
CHECKED:	-
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

Tinex Group Ltd
245 Te Puna Station Road
Te Puna

Existing Site Plan
Lot 2 DP 22158
Site Areas Plan

ORIGINAL DWG. SIZE A1
SCALE: 1:1000
DRAWING No. 423022-M-E-D002
SHEET No. 02a
ISSUE A





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GENERAL

- Boundaries have been obtained from LINZ Data Service and have not been verified.
- Areas and measurements are approximate and subject to survey.
- Appurtenant or proposed / existing easements in relation to the subject land may not have been shown if not required for compliance of this proposal.



SERVICES

- Services have been obtained from WBOPDC GIS and have not been ground verified

SURVEY

- Datum
 Horizontal datum: Bay of Plenty 2000
 Vertical datum: NZVD 2016
 Origin Mark: Te Puna Station - BDWU - 4th Order
 Source: LINZ Data Service

SURFACES

- Existing contour interval
 Major = 2.5m 
 Minor = 0.5m 
- Contours have been obtained from RECON Limited and have not been verified on ground.

No.	Date	By	Issue/Revision
A	31.05.23	SB	FOR CONSENT

NOTES/KEY:

DRAWN:	MJH
CHECKED:	-
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

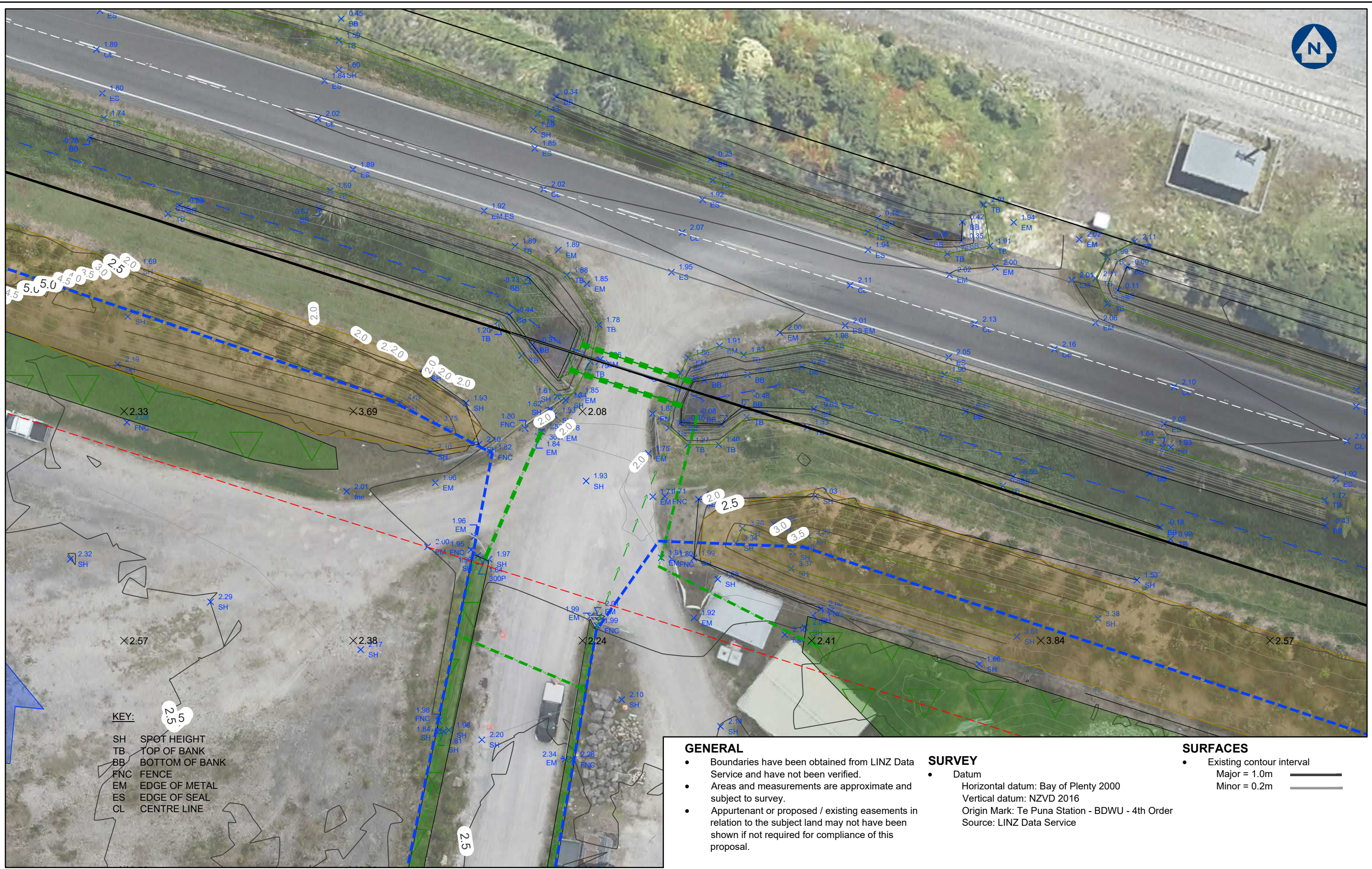
Tinex Group Ltd
245 Te Puna Station Road
Te Puna

Existing Site Plan
Lot 2 DP 22158
CURRENT SITE USAGE

ORIGINAL DWG. SIZE A1
SCALE: 1:1000
DRAWING No. 423022-M-E-D002
SHEET No. 03 ISSUE A



Planners | Engineers | Surveyors



KEY:

- SH SPOT HEIGHT
- TB TOP OF BANK
- BB BOTTOM OF BANK
- FNC FENCE
- EM EDGE OF METAL
- ES EDGE OF SEAL
- CL CENTRE LINE

GENERAL

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- Areas and measurements are approximate and subject to survey.
- Appurtenant or proposed / existing easements in relation to the subject land may not have been shown if not required for compliance of this proposal.

SURVEY

- Datum
Horizontal datum: Bay of Plenty 2000
Vertical datum: NZVD 2016
Origin Mark: Te Puna Station - BDWU - 4th Order
Source: LINZ Data Service

SURFACES

- Existing contour interval
Major = 1.0m
- Minor = 0.2m

No.	Date	By	Issue/Revision
A	22.10.20	SMM	FOR CONSENT

NOTES/KEY:

DRAWN:	SMM
CHECKED:	-
DESIGNED:	-
SURVEYED:	SMM
OFFICE:	TE PUKE
CONTACT:	07 573 7717

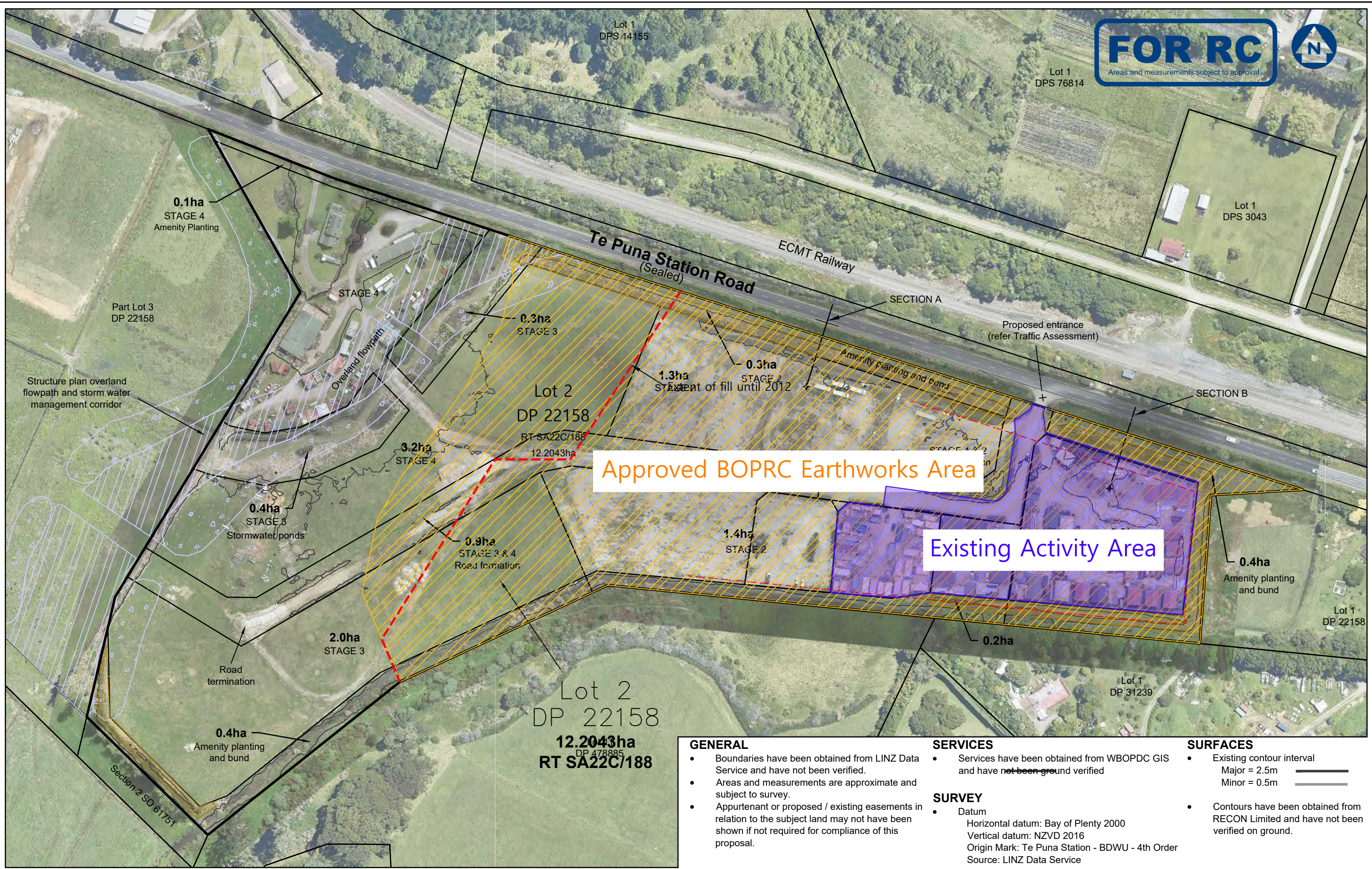
TINEX GROUP LTD
245 TE PUNA STATION ROAD
TE PUNA

ENTRANCE SURVEY
LOT 2 DP 22158

SERVICES NOTE
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ORIGINAL DWG. SIZE A3
SCALE: 1:300
DRAWING No. 423022-T-P-D001
SHEET No. 04 ISSUE A





Approved BOPRC Earthworks Area

Existing Activity Area

GENERAL

- Boundaries have been obtained from LINZ Data Service and have not been verified.
- Areas and measurements are approximate and subject to survey.
- Appurtenant or proposed / existing easements in relation to the subject land may not have been shown if not required for compliance of this proposal.

SERVICES

- Services have been obtained from WBOPDC GIS and have not been ground verified
- SURVEY**
- Datum
Horizontal datum: Bay of Plenty 2000
Vertical datum: NZVD 2016
Origin Mark: Te Puna Station - BDWU - 4th Order
Source: LINZ Data Service

SURFACES

- Existing contour interval
Major = 2.5m
Minor = 0.5m
- Contours have been obtained from RECON Limited and have not been verified on ground.

No.	Date	By	Issue/Revision
C	-	-	-
B	19.10.22	MJP	Structure plan overlay and staging
A	27.05.21	MJH	DRAFT

NOTES/KEY:

	WBOPDC Structure Plan Stormwater ponds
	WBOPDC Structure Plan Overland flow path

DRAWN:	MJH
CHECKED:	-
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

TINEX GROUP LTD
245 TE PUNA STATION ROAD
TE PUNA

**DEVELOPMENT OF TE PUNA
STRUCTURE PLAN
LOT 2 DP 22158**

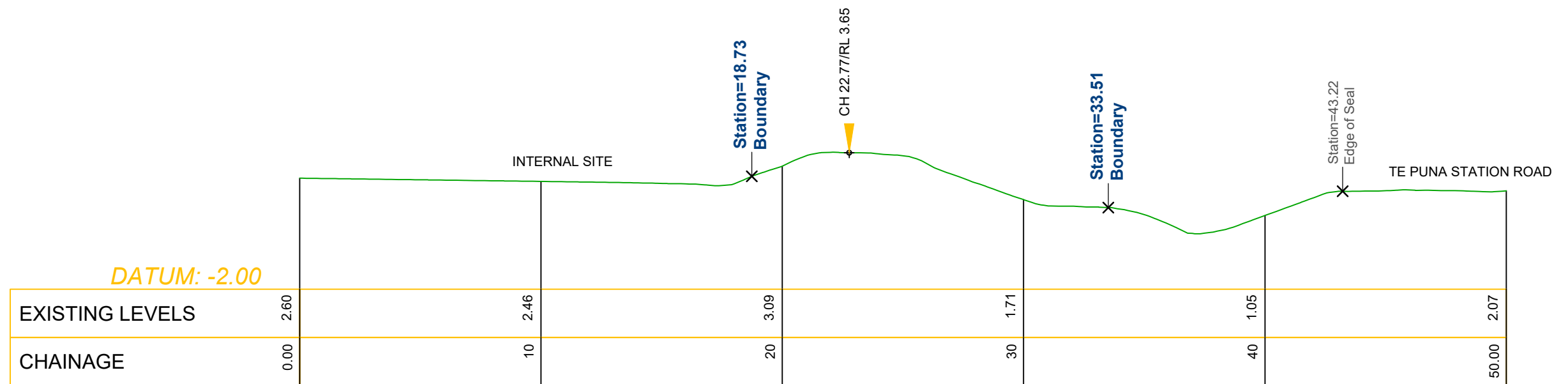
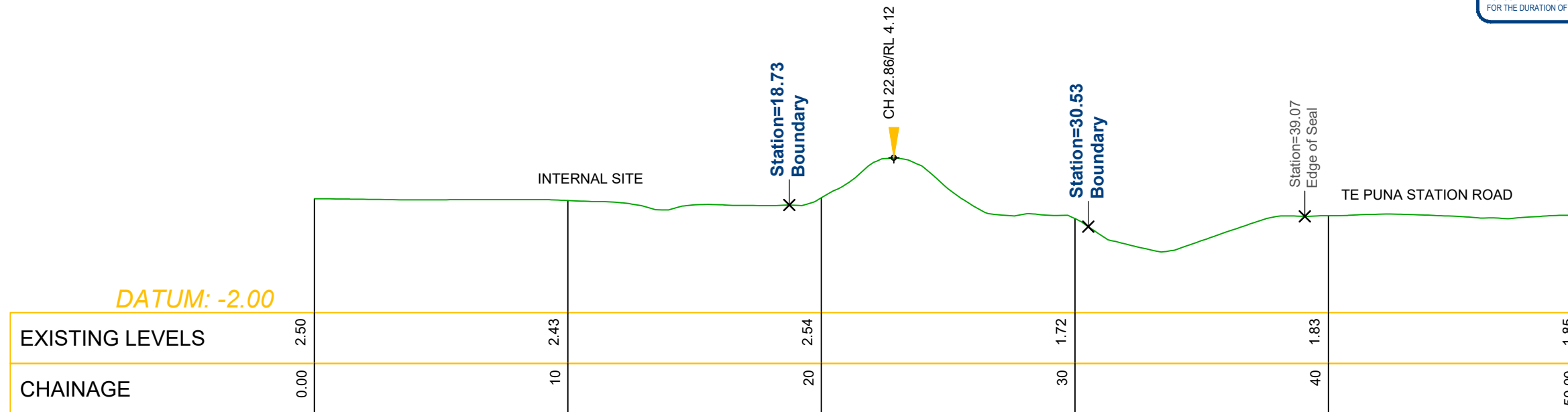
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ORIGINAL DWG. SIZE A3
SCALE: 1:2000
DRAWING No. 423022-T-P-D001
SHEET No. 05
ISSUE B





SERVICES NOTE
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No.	Date	By	Issue/Revision
C	-	-	-
B	20.10.22	MJP	S92 response
A	27.05.21	MJH	DRAFT

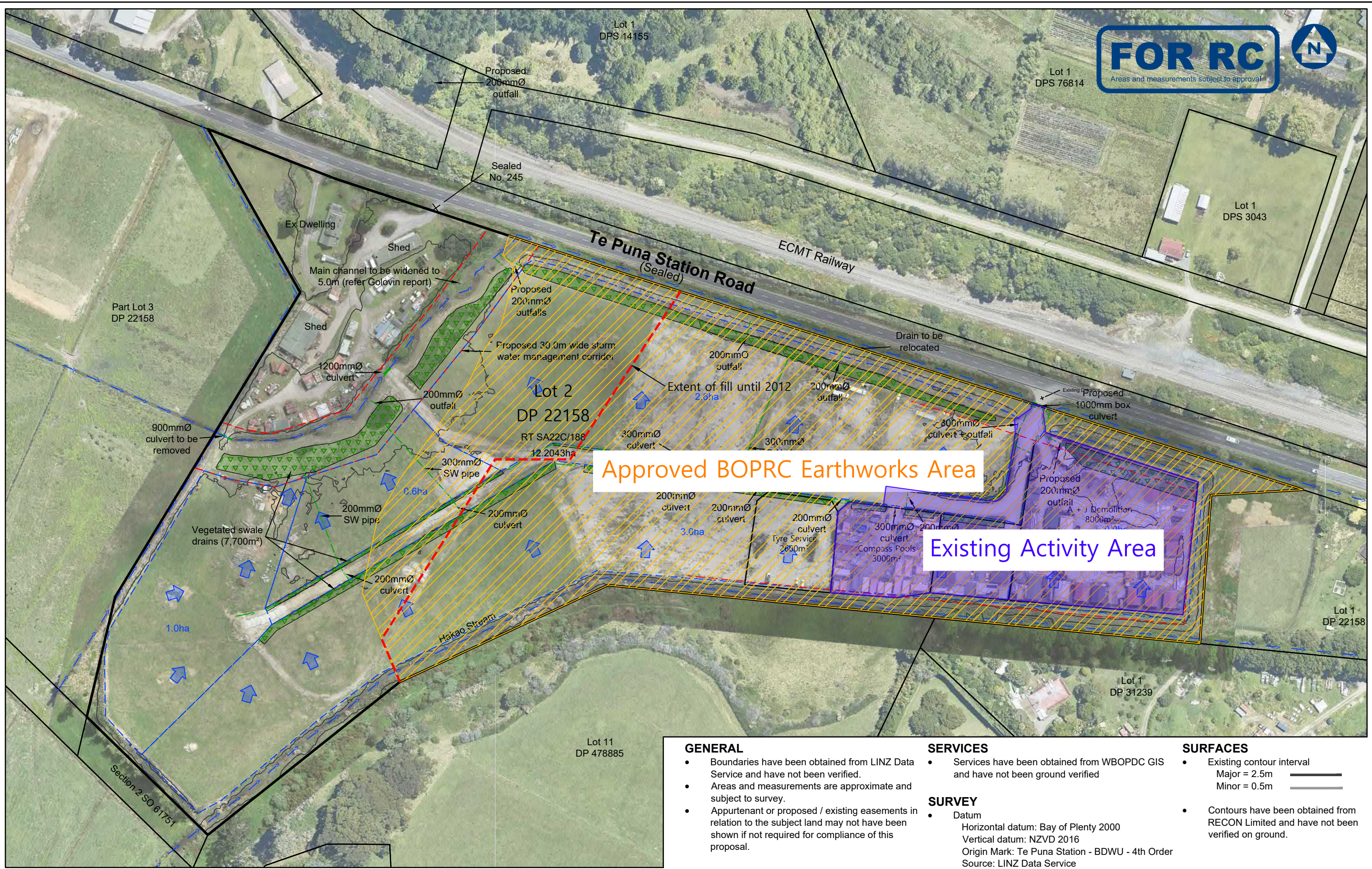
NOTES/KEY:

DRAWN:	MJH
CHECKED:	-
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

TINEX GROUP LTD
245 TE PUNA STATION ROAD
TE PUNA

ORIGINAL DWG. SIZE A3
 SCALE: 1:2000
 DRAWING No. 423022-T-P-D001
 SHEET No. 06 ISSUE B

Planners | Engineers | Surveyors



Approved BOPRC Earthworks Area

Existing Activity Area

GENERAL

- Boundaries have been obtained from LINZ Data Service and have not been verified.
- Areas and measurements are approximate and subject to survey.
- Appurtenant or proposed / existing easements in relation to the subject land may not have been shown if not required for compliance of this proposal.

SERVICES

- Services have been obtained from WBOPDC GIS and have not been ground verified

SURVEY

- Datum
Horizontal datum: Bay of Plenty 2000
Vertical datum: NZVD 2016
Origin Mark: Te Puna Station - BDWU - 4th Order
Source: LINZ Data Service

SURFACES

- Existing contour interval
Major = 2.5m
Minor = 0.5m
- Contours have been obtained from RECON Limited and have not been verified on ground.

No.	Date	By	Issue/Revision
C	-	-	-
B	18.10.22	MJP	Updated plan
A	01.09.22	MJM	DRAFT

NOTES/KEY:

	Vegetated swale drains
	Existing flow path
	Existing flow direction

DRAWN:	MJP
CHECKED:	SJB
DESIGNED:	-
SURVEYED:	-
OFFICE:	TE PUKE
CONTACT:	07 573 7717

TINEX GROUP LTD
245 TE PUNA STATION ROAD
TE PUNA

STORM WATER AND SURFACE DRAINAGE/ TREATMENT PLAN
LOT 2 DP 22158

SERVICES NOTE
WHERE EXISTING SERVICES ARE SHOWN, THEY ARE INDICATIVE ONLY AND MAY NOT INCLUDE ALL SITE SERVICES. STRATUM CONSULTANTS LTD DOES NOT WARRANT THAT ALL OR INDEED ANY SERVICES ARE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE CONTRACT WORKS.

ORIGINAL DWG. SIZE A3
SCALE: 1:2000
DRAWING No. 423022-T-P-D001
SHEET No. 07 ISSUE B

