

**BRIGHAM CREEK AND TRIG ROAD, WHENUAPAI.**

**FOR: BULK EARTHWORKS APPROVAL**

**SITE ADDRESS: 151, 155-157 BRIGHAM CREEK ROAD & 69 TRIG ROAD.**

**NEIL CONSTRUCTION LIMITED**

**JOB No. 447-01**

**NOVEMBER 2019**

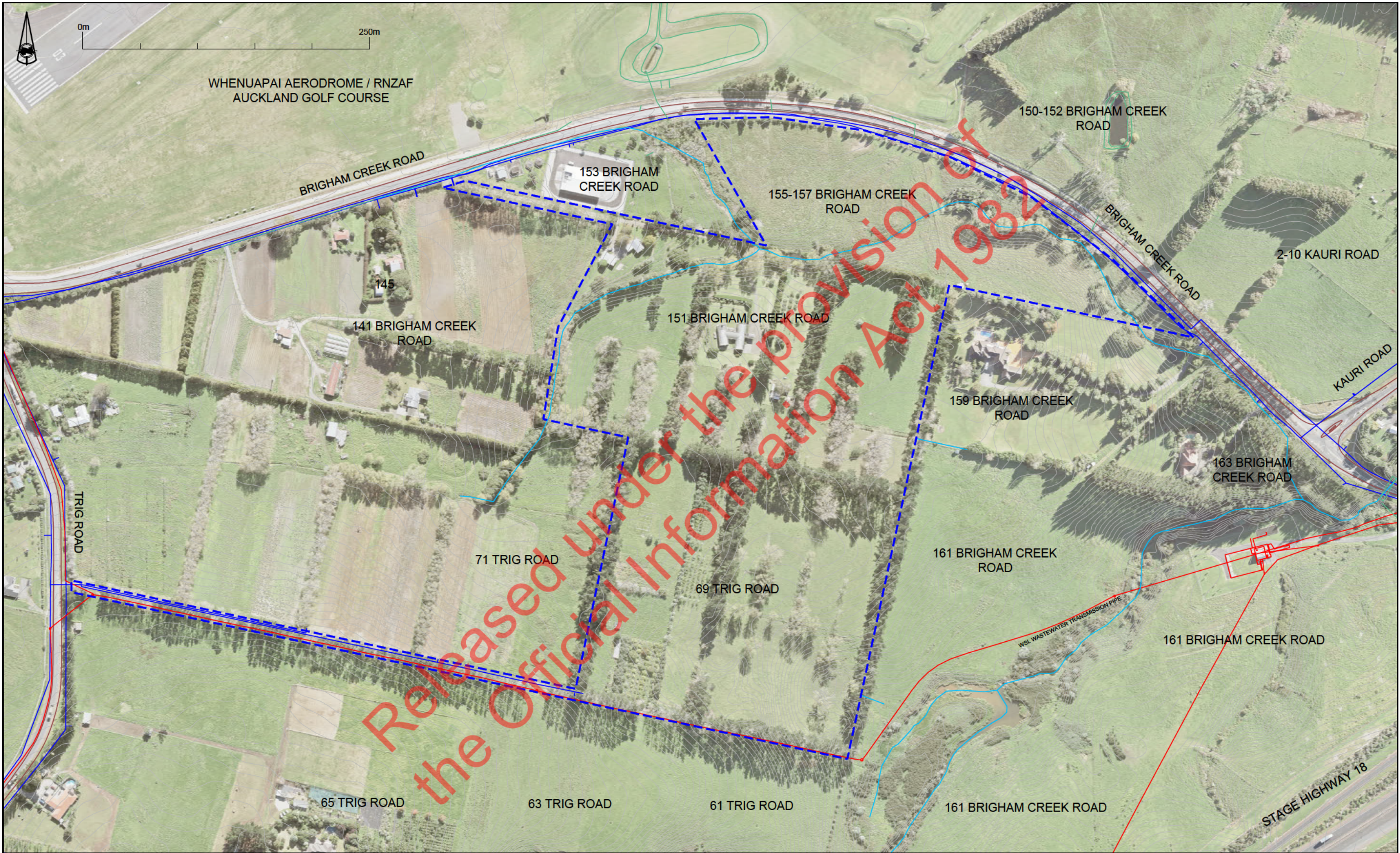
**AUTHORITY: AUCKLAND COUNCIL**

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## (BULK EARTHWORKS)

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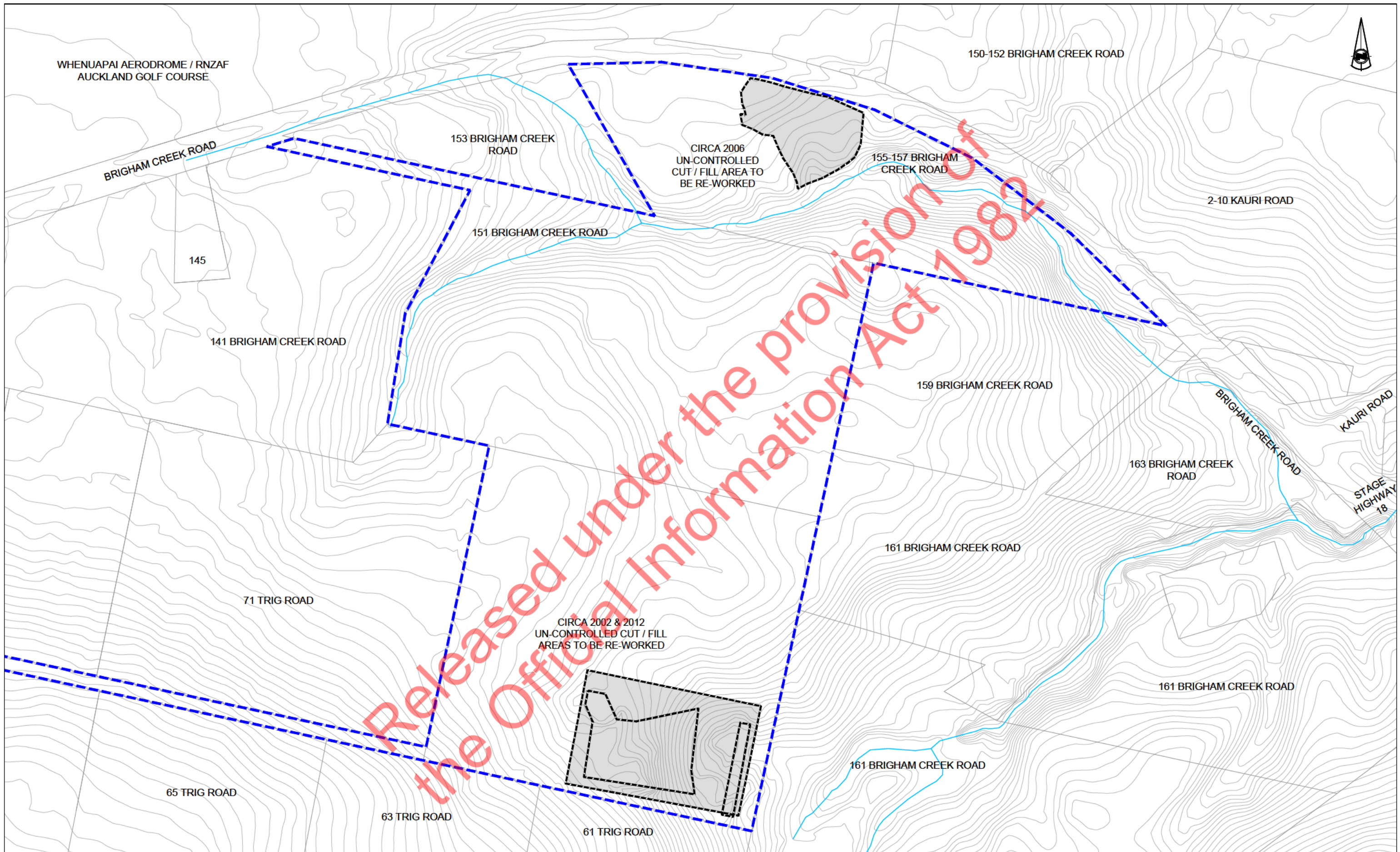
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Job Title
BRIGHAM CREEK & TRIG ROAD WHENUAPAI

Drawing Title
BULK EARTHWORKS EXISTING SITE AERIAL & GIS

By	Date	Scale	Job No.	Rev
Surveyed: DS		1:3000@A3	Drawing No.	A
Designed: CK			447-01-BE-100	
Drawn: CK	11/19			
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CAD FILE	F:\PROJECTS\BRIGHAM CREEK TRIG\DWG\ENG\BULK_EW\447-01-EW-100.dwg			





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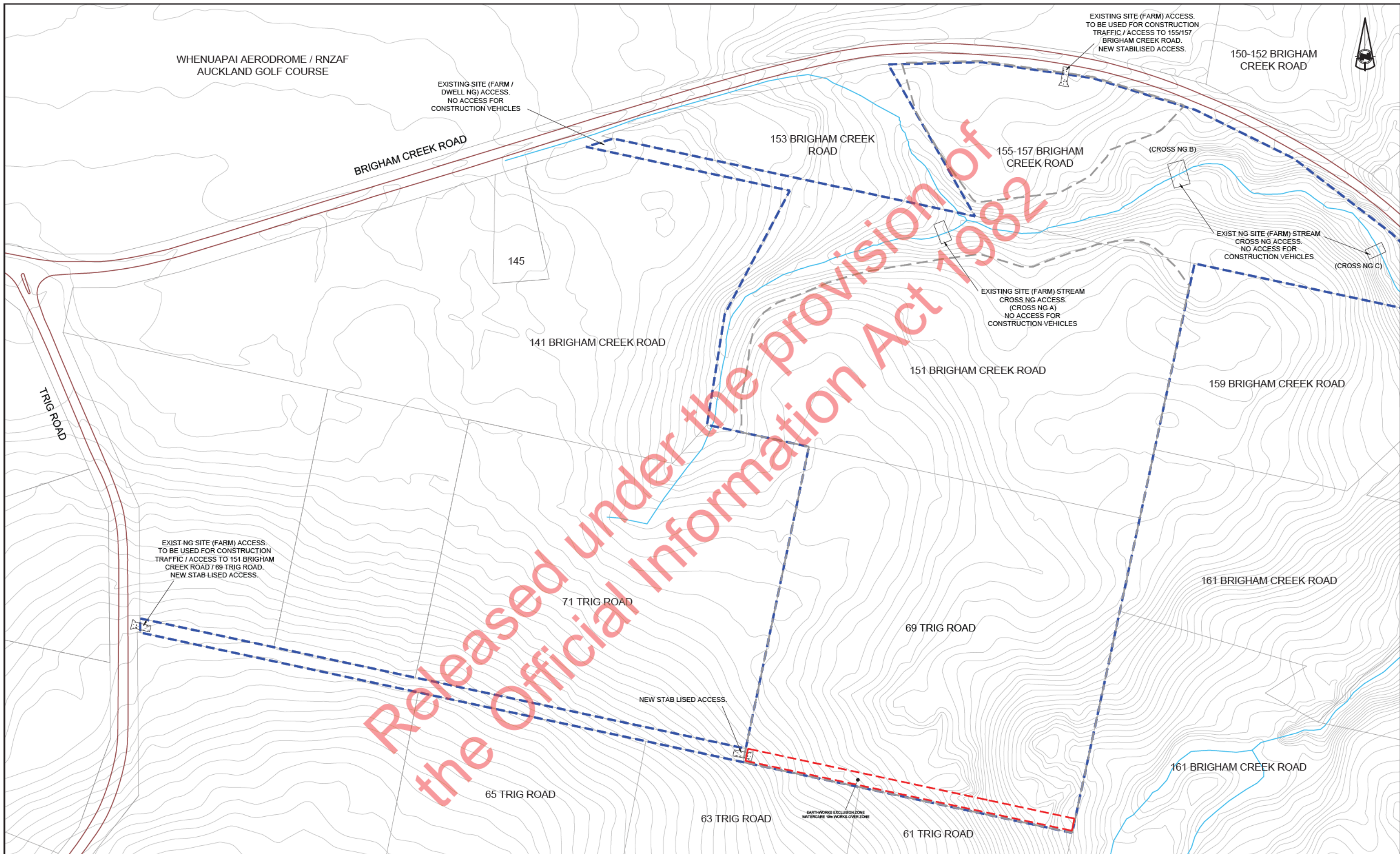
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Job Title  
**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
EXISTING SITE  
HISTORICAL EARTHWORK AREAS**

By	Date	Scale	Job No.	Rev
Surveyed: DS		1:2500@A3	Drawing No.	A
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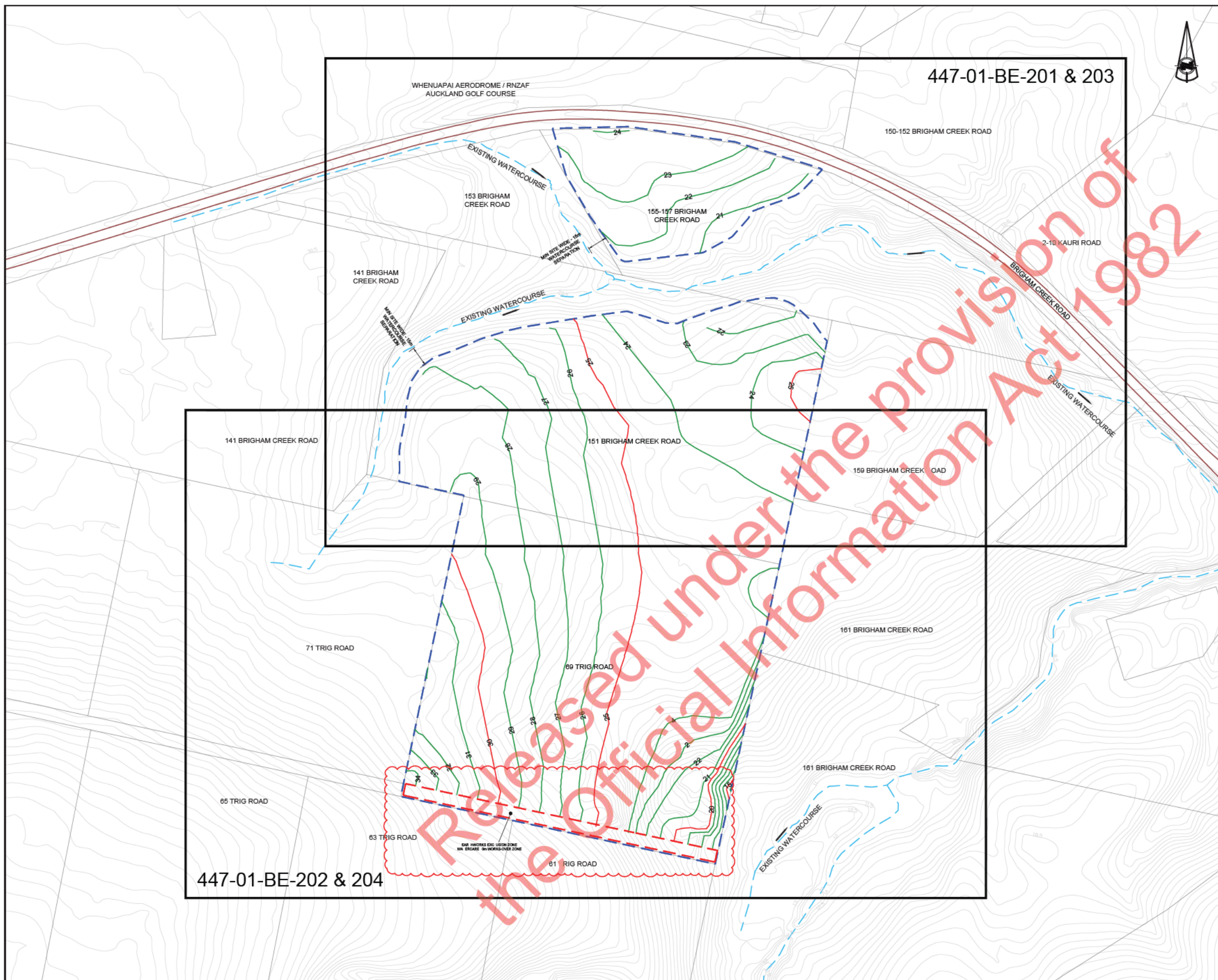
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Job Title  
**BRIGHAM CREEK & TRIG ROAD  
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Drawing Title  
**BULK EARTHWORKS  
EXISTING SITE  
SITE ACCESS**

By	Date	Scale	Job No.	Rev
Survised: DS		1:2500@A3	Drawing No.	
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#### EARTHWORKS

STAGE / AREA (ha) CUT (m3) FILL (m3) BALANCE (m3)

155-157 BRIGHAM CREEK RD

1.29ha 2,100 2,100 -

SITE ALSO HAS AREA OF REWORKED HISTORICAL EARTHWORKS.

151 BRIGHAM CREEK AND 69 TRIG RD

10.40ha 46,100 46,100 -

SITE ALSO HAS AREA OF REWORKED HISTORICAL EARTHWORKS.

#### TOTAL SITE EARTHWORKS AREA

11.69ha 48,200 48,200 -

SITE ALSO HAS AREA OF REWORKED HISTORICAL EARTHWORKS.

#### NOTE:

1. ABOVE VOLUMES ARE RAW SURFACE TO SURFACE AND DO NOT REPRESENT TOPSOIL, UNSUITABLE, SHRINKAGE OR CIVIL SPOIL ADJUSTED VOLUMES.

#### NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS, SPECIFICATIONS AND REPORTS.
2. ALL WORKS AND MATERIALS TO COMPLY WITH THE RELEVANT COUNCIL ENGINEERING STANDARDS AND IN ACCORDANCE WITH THE BUILDING CODE.
3. THE CONTRACTOR IS TO LOCATE AND CONFIRM THE LOCATION OF ALL UTILITY SERVICES ON SITE, PRIOR TO ANY WORKS COMMENCING, INCLUDING PROTECTION OF THE SAME THROUGHOUT THE DURATION OF THE WORKS.
4. THE CONTRACTOR IS TO ENSURE THEY HAVE READ THE RESOURCE CONSENT, INCLUDING CONDITIONS, AND COMPLY FULLY.
5. THE CONTRACTOR IS TO ENSURE THEY HAVE READ THE GEOTECHNICAL INVESTIGATION REPORT.
6. REFER TO THE ABOVE REFERENCED G.I.R. FOR FULL DETAILS OF COUNTERFORT DRAINAGE, UNDERFILL DRAINAGE, SEEPAGE BARRIER KEYS & ALL OTHER GEOTECHNICAL REQUIREMENTS.
7. VOLUMES SHOULD NOT BE USED FOR CONTRACTOR COSTING.
8. EXISTING CONTOURS FROM SITE SURVEY AND COUNCIL GIS.

#### LEGEND

- PROPOSED CONTOUR MINOR (1m)
- PROPOSED CONTOUR MAJOR (5m)
- EXISTING CONTOURS (0.5m)
- PROPOSED CUT CONTOUR (1m)
- PROPOSED FILL CONTOUR (1m)
- PROPOSED ZERO CONTOUR
- EXTENT OF EARTHWORKS
- EARTHWORKS EXCLUSION ZONE  
WATERCARE 10m WORKS OVER ZONE

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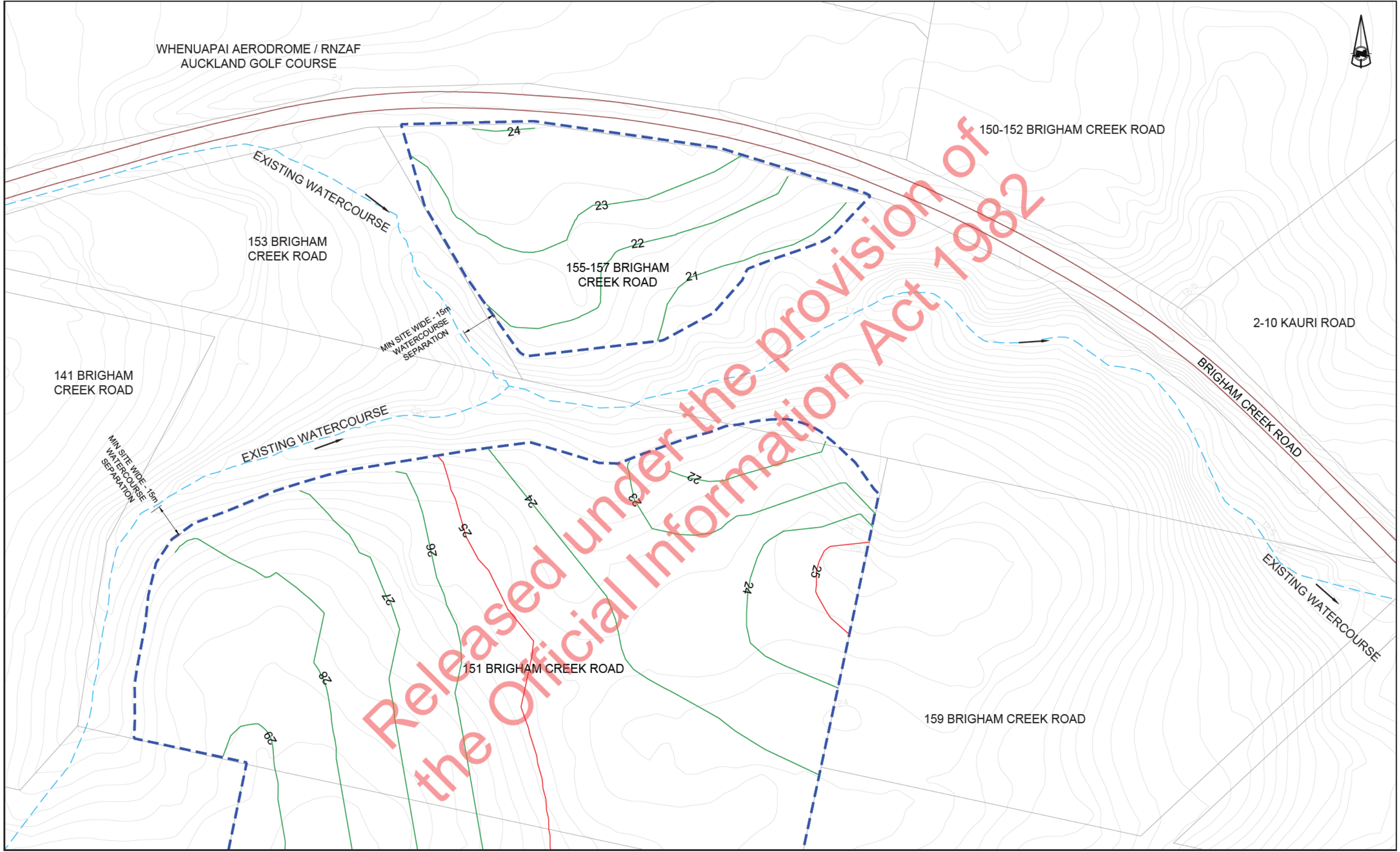
**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title

**BULK EARTHWORKS  
FINISHED CONTOURS  
LOCATION PLAN**

By	Date	Scale	Job No.	Rev
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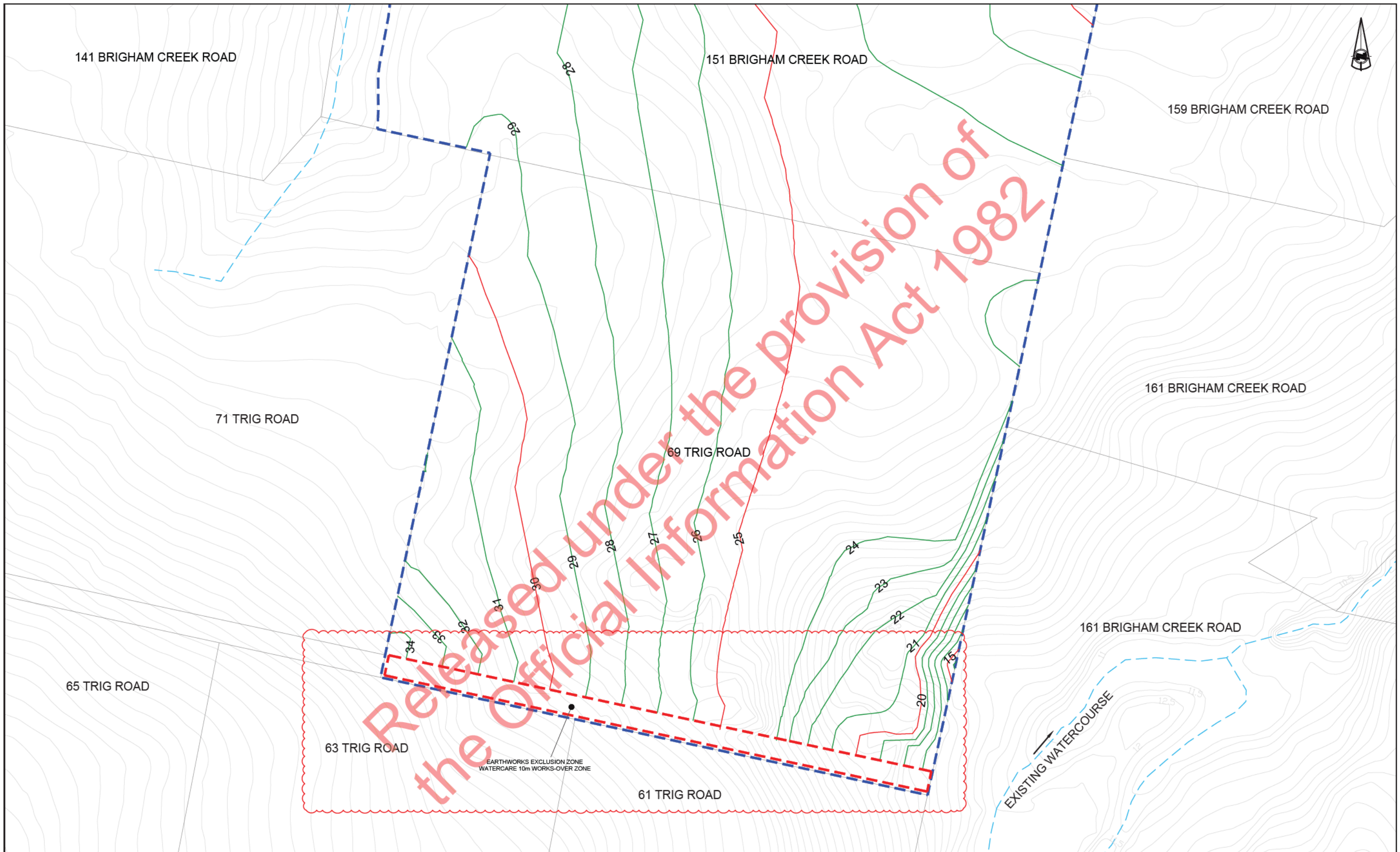
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Drawing Title  
**BULK EARTHWORKS  
FINISHED CONTOURS**

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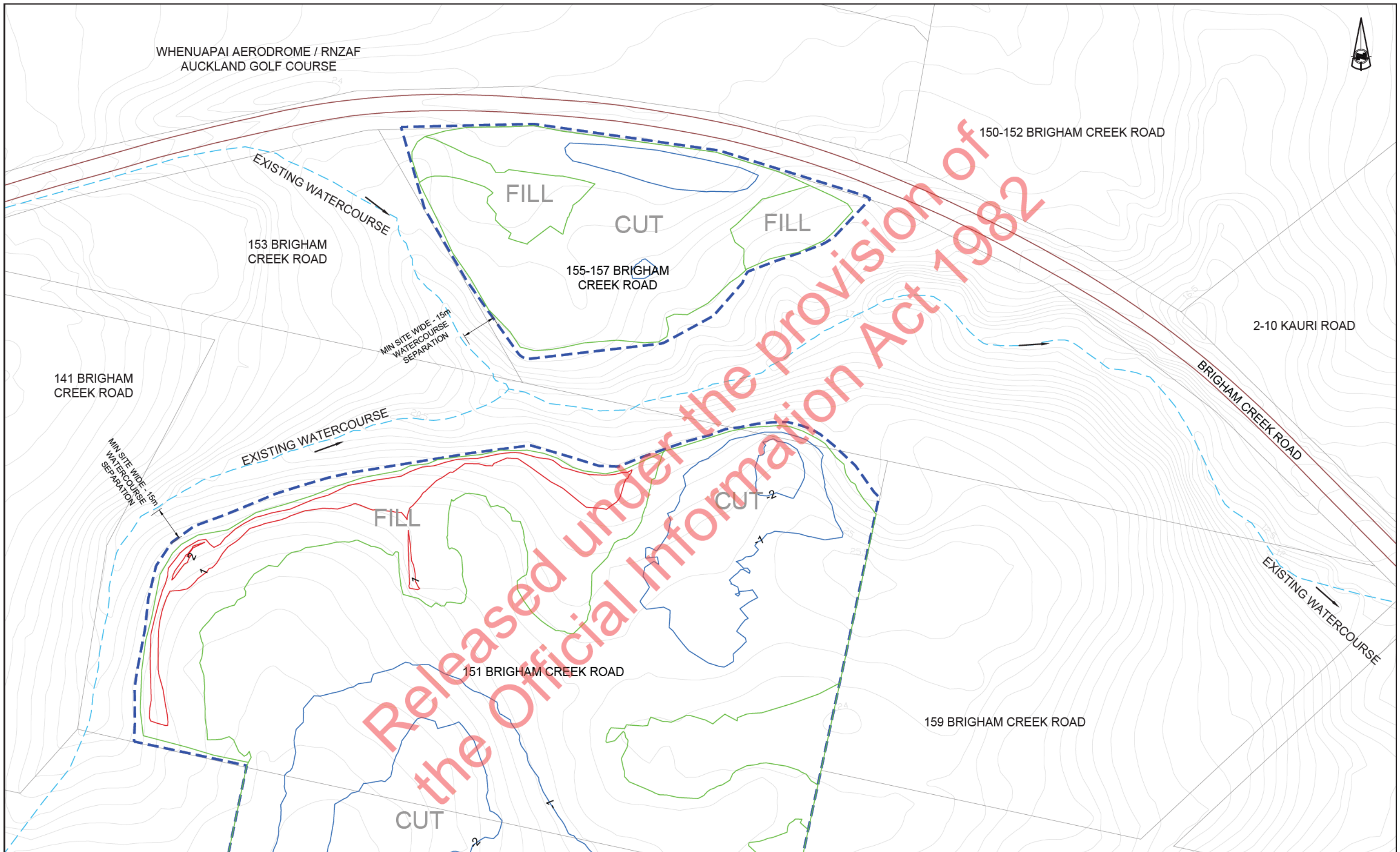
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WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
FINISHED CONTOURS**

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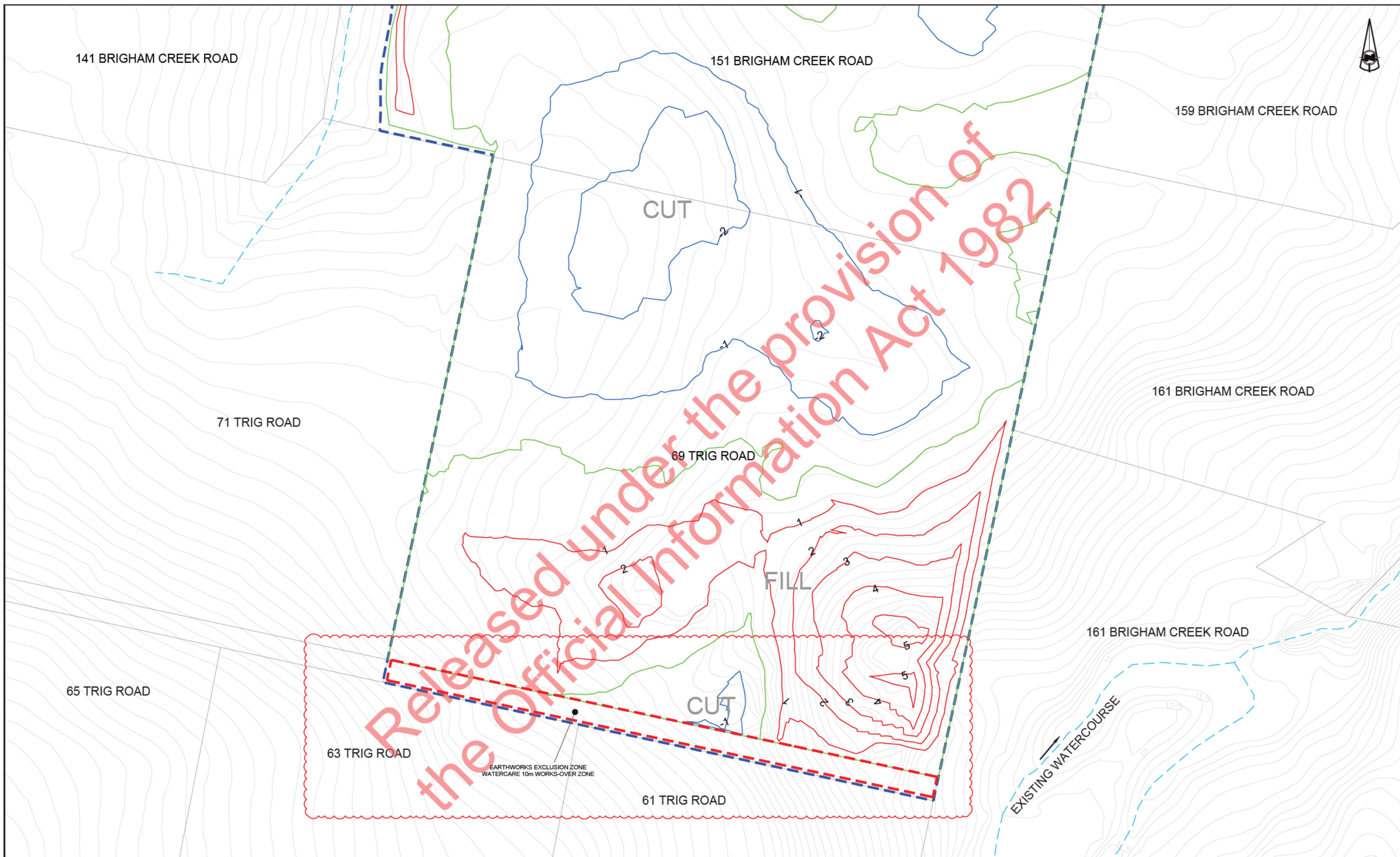
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**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
FINISHED CONTOURS  
CUT FILL**

By	Date	Scale	Job No.	Rev
Surveyed: DS		1:1500@A3	Drawing No.	
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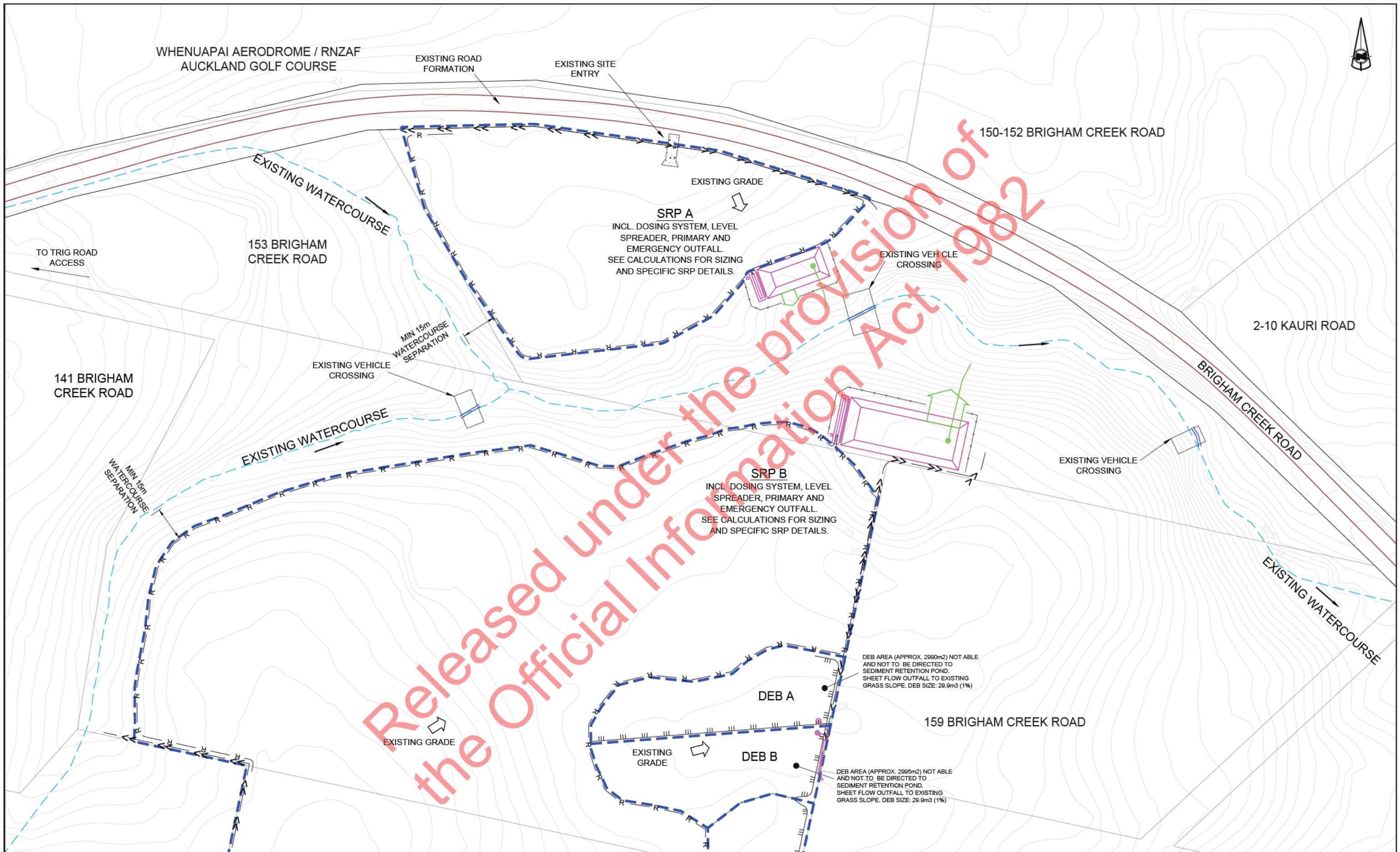






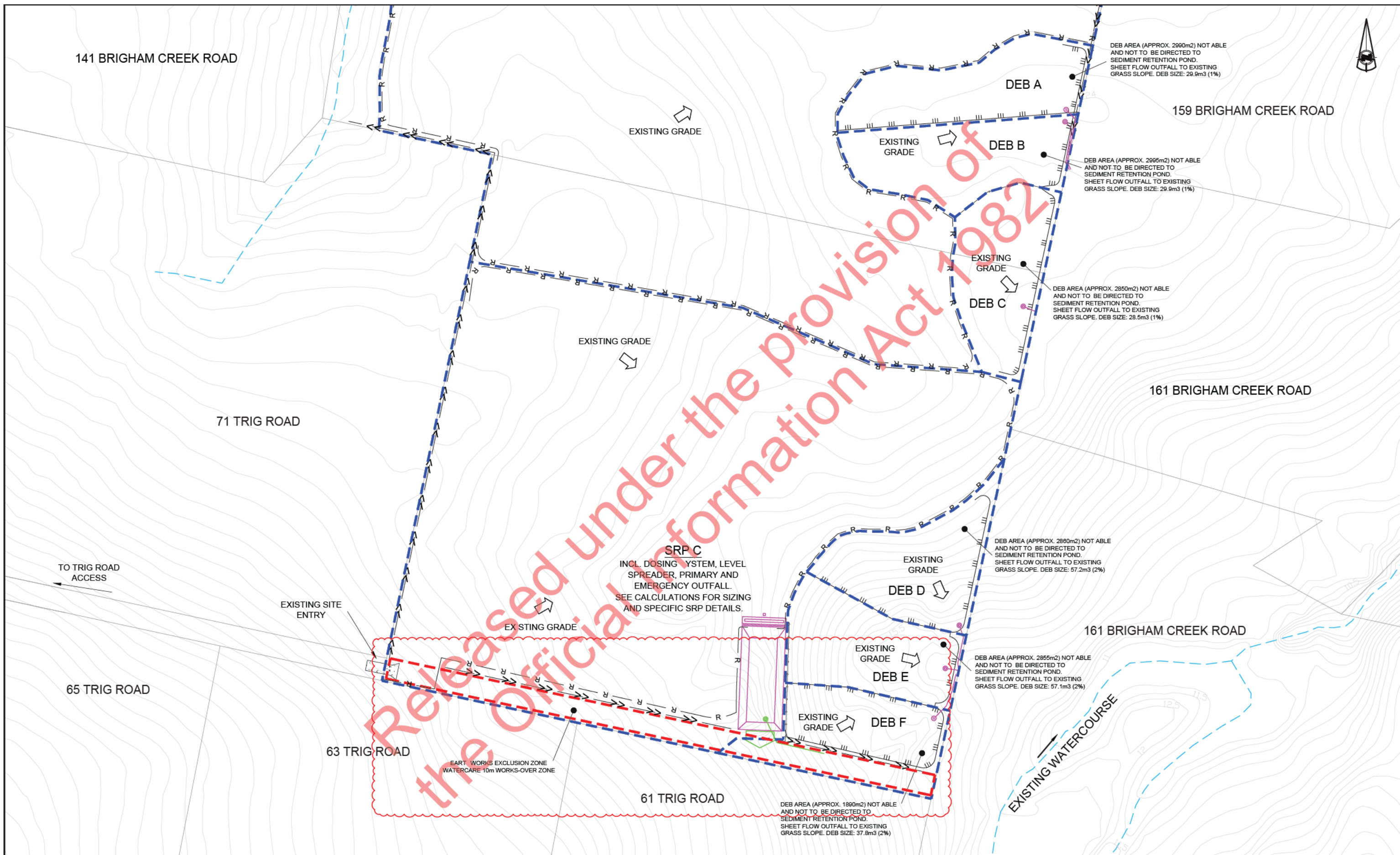






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THE NEIL GROUP LIMITED LEVEL 3, BUILDING B 8 NUGENT STREET GRAFTON				PO BOX 8751, SYMONDS STREET AUCKLAND, NEW ZEALAND  TELEPHONE: +64 9 918 8565 FACSIMILE: +64 9 918 8567 WEB: www.neilgroup.co.nz															
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B	AC BEW S92 COMMENTS	CK	06/20					Designed:	CK					
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								Approved:	CK					
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#### GENERAL NOTES:

ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE AUCKLAND COUNCIL GUIDELINE DOCUMENT 2016/05 (GD05), INCLUDING ALL SUBSEQUENT AMENDMENTS.

ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE OPERATIONAL PRIOR TO ANY OTHER WORKS COMMENCING ON SITE.

ANY MODIFICATIONS TO THE CONSENTED EROSION AND SEDIMENT CONTROL DRAWING MUST BE APPROVED BY THE ENGINEER AND AUCKLAND COUNCIL PRIOR TO CONSTRUCTION.

A COPY OF THE EROSION MANAGEMENT PLAN SHALL BE AVAILABLE ON THE SITE DURING WORK HOURS AND ALL PERSONNEL INVOLVED IN EARTHWORK ACTIVITIES ON THE SITE (INCLUSIVE OF SUBCONTRACTORS) SHALL BE FAMILIAR WITH THE CONSENT AND PLAN REQUIREMENTS AS THEY RELATE TO EROSION AND SEDIMENT CONTROL.

#### SEDIMENT POND NOTES:

FINAL LOCATION OF PONDS TO BE DETERMINED ON SITE BY THE ENGINEER IN CONJUNCTION WITH AUCKLAND COUNCIL.

VOLUMES SHOWN FOR SEDIMENT PONDS ARE MINIMUM REQUIREMENTS. ALL PONDS ARE TO BE CONSTRUCTED TO DIMENSIONS STATED, SPECIFIC TO EACH POND.

PONDS ARE TO BE CONSTRUCTED BASED ON GD05 AND THE RELEVANT DRAWINGS AND CALCULATIONS.

ALL SEDIMENT RETENTION PONDS ARE TO BE CLEANED OUT BEFORE THE BASE SEDIMENT REACHES 20% OF POND VOLUME.

#### CONTOUR DRAIN NOTES:

CONTOUR DRAINS SHOULD BE USED TO CONTROL RUNOFF ON CONSTRUCTION AREAS AND ARE GENERALLY OF A TEMPORARY NATURE. THEY ARE COMMONLY USED ON LONG NARROW SLOPING AREAS.

CONTOUR DRAINS TO BE FORMED AT INTERVALS INDICATED BELOW AT THE COMPLETION OF EACH DAYS WORK.

CONTOUR DRAIN SPACING AS PER GD05.

GRADES SHOULD BE KEPT AS SHORT AS PRACTICABLE. AS WITH DIVERSION DRAINS THESE MUST BE CHECKED AFTER RAINFALL. AND DURING PROLONGED PERIODS OF HEAVY RAINFALL. THESE DRAINS MUST BE MAINTAINED TO ENSURE THEIR EFFECTIVENESS

#### SEDIMENT CONTROL AND MONITORING NOTES:

SEDIMENT CONTROL MEASURES MUST BE MAINTAINED TO ENSURE EFFECTIVE OPERATION.

THE CONTRACTOR MUST INSPECT ALL CONTROL MEASURES ON A DAILY BASIS AND AFTER ALL STORM EVENTS.

CONTRACTOR INSPECTIONS ARE TO BE CARRIED OUT BY AN APPROPRIATELY QUALIFIED AND EXPERIENCED ENGINEER TO CERTIFY THAT THE EROSION AND SEDIMENT CONTROLS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN.

A CERTIFICATE AND ASBUILT INDICATING THAT ALL THE APPROPRIATE SEDIMENT CONTROL MEASURES ARE INSTALLED WILL BE SUBMITTED TO THE ARC WITHIN 7 DAYS FOLLOWING THE CONSTRUCTION OF THE CONTROLS.

#### DIVERSION DRAIN NOTES:

AS FAR AS PRACTICAL ALL CLEAN WATER IS TO BE DIVERTED AWAY FROM THE AREA OF WORKS. CLEAN WATER DIVERSION DRAINS ARE TO BE STABILISED PRIOR TO DIVERTING THE WATER. MINIMUM DRAIN SIZES BEING 0.5m BASE WIDTH x 0.3m DEEP (INCLUDING 0.3m FREE BOARD) SIDE SLOPE BATTERS 1v TO 3H.

#### DECANTING EARTH BUND NOTES:

DECANTING EARTH BUNDS TO SERVICE A MAXIMUM CATCHMENT OF 0.3ha AND CONSIST OF A MINIMUM SRP T-BAR DECANT SYSTEM WITH RECOMMENDED DECANT RATE OF 0.3L/S/1000m<sup>3</sup>. DECANT SIZE TO BE 1% CONTRIBUTING AREA FOR UP TO 18% SLOPES AND 2% FOR OVER 18% SLOPES. BUND TO BE MINIMUM 2m WIDE AT BASE WITH 3:1 TO 5:1 LENGTH TO WIDTH RATIO. PRIMARY SPILLWAY TO BE 150mm UPSTAND WITH EMERGENCY SPILLWAY SIZED LARGER OF 1% AEP OR 1.5m

#### STOCKPILE NOTES:

TOPSOIL & CLAY STOCKPILES ARE TO COMPRISE OF EITHER DECANTING EARTH BUNDS OR SILT FENCE LOCATED AT THE TOE OF THE STOCKPILE.

### GD 05 (2016) SEDIMENT RETENTION POND SIZING

#### PROJECT DATA

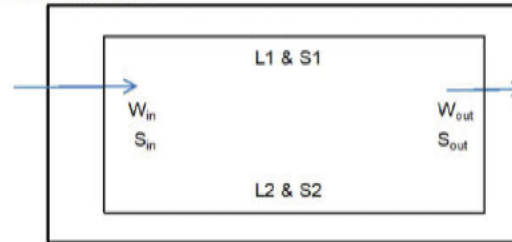
PROJECT NO.: 447 DATE: Nov-19 BY: CK

SITE DESCRIPTION: 69 Trigg Road - Whenuapai - (Bulk Earthworks Only Application)

#### SEDIMENT RETENTION POND SIZING

Labels for pond base dimensions

W = Width  
L = Length  
S = Slope



PLAN VIEW OF POND

	Units	Pond Number				Notes
		A	B	C	-	
Contributing Catchment	ha	1.29	4.95	3.68		
Min Volume Design Criteria	%	3%	3%	3%		
Min Volume	m <sup>3</sup>	387	1485	1104		3% if catchment slope > 10% or catchment length > 200m, otherwise 2%
Target Pond L:W ratio	1:	3	3	3		Ideal is between 1:3 and 1:5
Trial Length (L1 = L2)	m	18.3	43.8	36.6		
Batter slope (1 vert: S1 horz)	1:	2	2	2		1:2 is normal side batter slope
Batter slope (1 vert: S2 horz)	1:	2	2	2		1:2 is normal side batter slope
Width (W <sub>in</sub> = W <sub>out</sub> )	m	6.1	14.6	12.20		
Batter slope in (1 vert: S <sub>in</sub> horz)	1:	3	3	3		1:3 is normal entry batter slope
Batter slope out (1 vert: S <sub>out</sub> horz)	1:	2	2	2		1:2 is normal exit batter slope
Base Area = L1 x W <sub>in</sub>	m <sup>2</sup>	111.6	639.5	446.5		
Trial Pond Depth (D)	m	1.7	1.7	1.7		Between 1 - 2m
(Permanent Depth / Sed. Storage)	m	0.5	0.5	0.5		30% of total storage, 0.4-0.8m in depth. 0.5m typical
(Working volume depth)	m	1.2	1.2	1.2		70% of total storage, 1.5m maximum preferable.
Top Length	m	26.8	52.3	45.1		
Top Width	m	12.9	21.4	19		
Top Area	m <sup>2</sup>	345.7	1119.2	856.9		
Volume of Pond at Depth D	m <sup>3</sup>	388.7	1494.9	1107.9		
Is Actual Vol larger than min Vol?		Yes	Yes	Yes		
Decanting System		Single	Triple	Triple		
Outlet Diameter	mm	150	300	300		
Overflow Riser						
Diameter	mm	None	1050	1050		
Freeboard	m	None	0.3	0.3		
Overflow embankment						
Freeboard	m	0.3	0.3	0.3		
Length	m	6.1	14.6	12.2		
Approximate Pond Levels:						
Top of Embankment Level	RL	20	21.5	24		
Level Spreader Weir Level	RL	19.8	21.3	23.8		200mm below top of embankment
Emergency Spillway Level	RL	19.7	21.2	23.7		300mm below top of embankment
Overflow Riser Level	RL	19.7	21.2	23.7		300mm below spillway, 600mm below embankment.
Maximum Operating Water Level	RL	19.7	21.2	23.7		
Pond Base Level	RL	18.0	19.5	22.0		
20% Sediment Clean Out Level	RL	18.3	19.8	22.3		20% of total storage / pond depth
Chemical dosing		Yes	Yes	Yes		Typically poly aluminium chloride (PAC)

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Job Title
<b>BRIGHAM CREEK &amp; TRIG ROAD WHENUAPAI</b>

Drawing Title
<b>BULK EARTHWORKS SEDIMENT AND EROSION CONTROL DETAILS</b>

	By	Date	Scale	Job No.	Rev
Surveyed:	DS			Drawing No.	
Designed:	CK			<b>447-01-BE-225</b>	<b>A</b>
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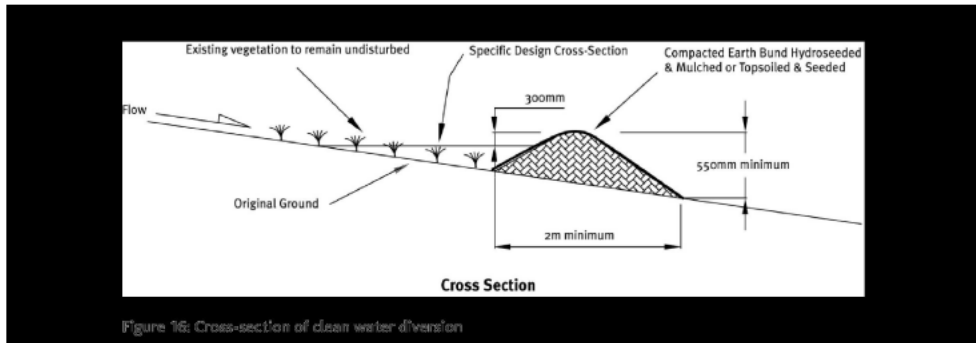


Figure 16: Cross-section of clean water diversion

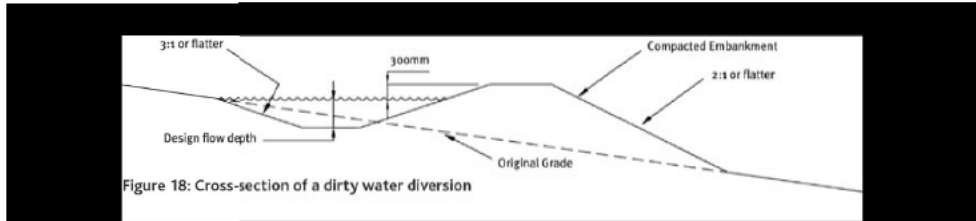


Figure 18: Cross-section of a dirty water diversion

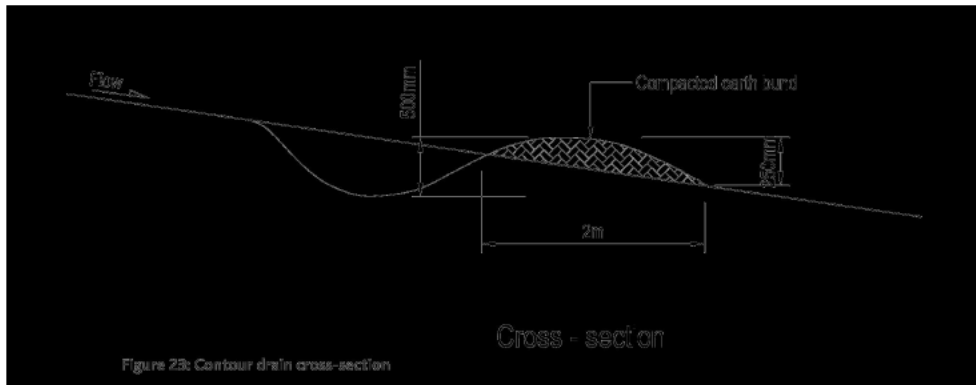


Figure 23: Contour drain cross-section

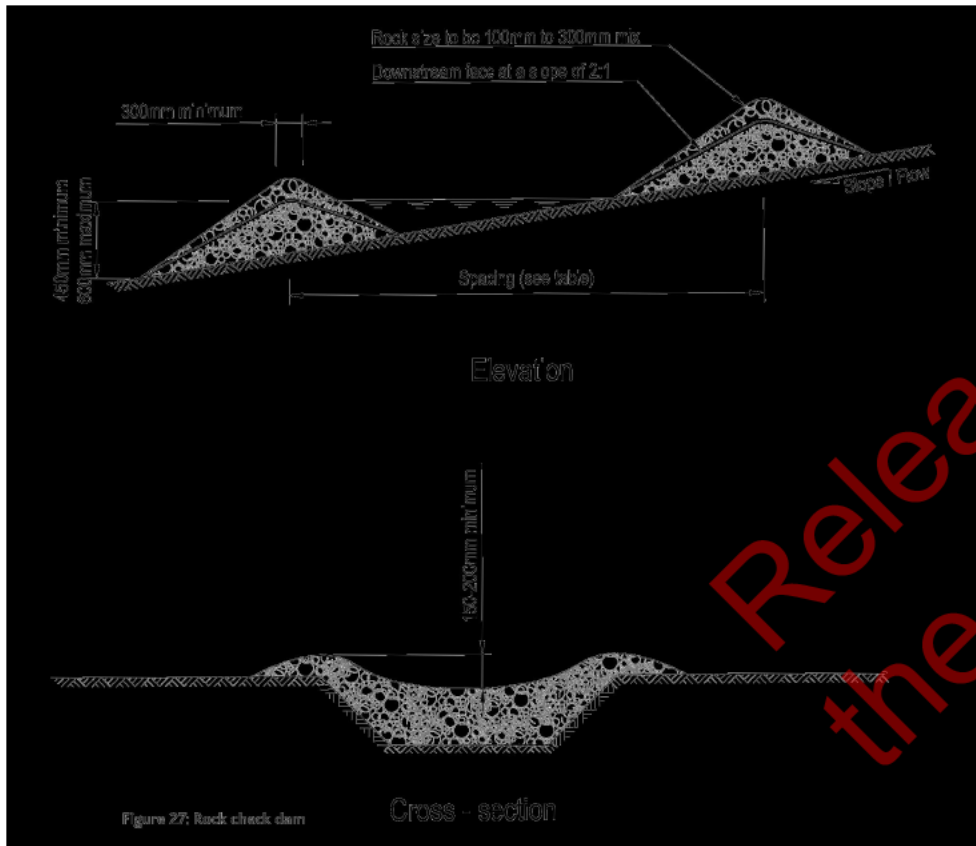


Figure 27: Rock check dam



Figure 35: Stabilised entranceway

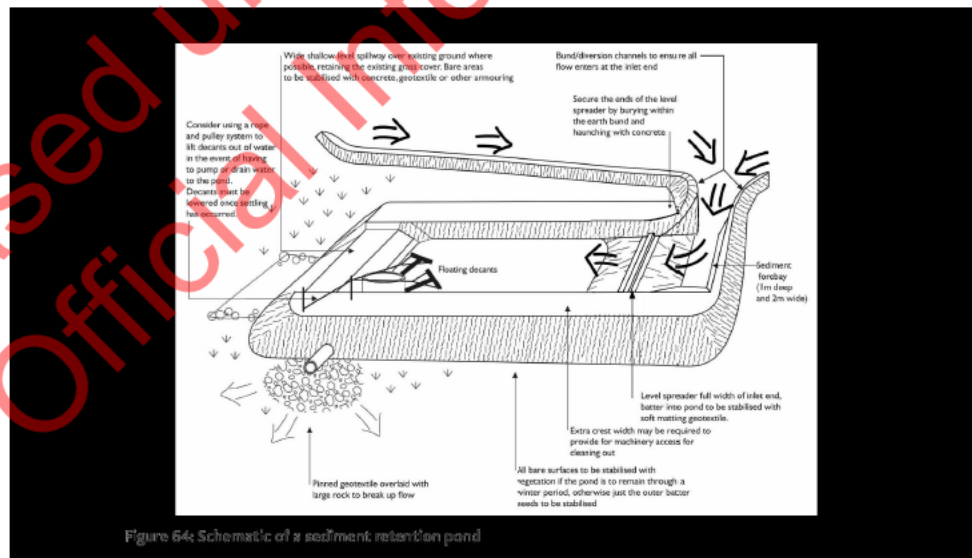


Figure 64: Schematic of a sediment retention pond

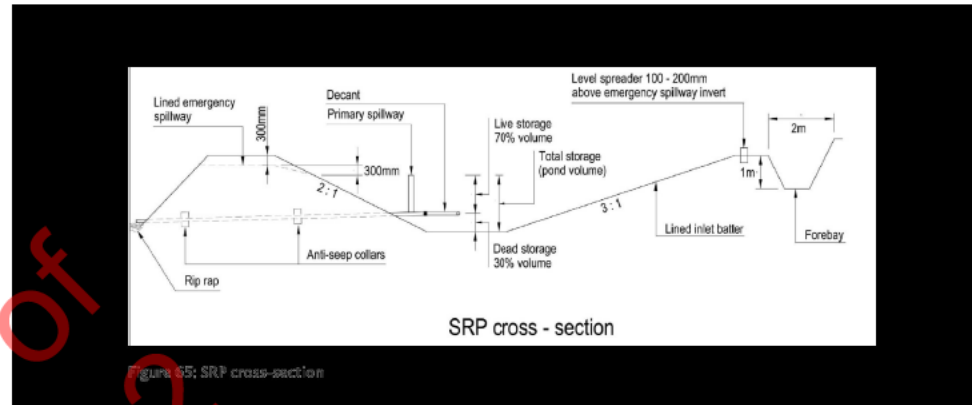


Figure 65: SRP cross-section

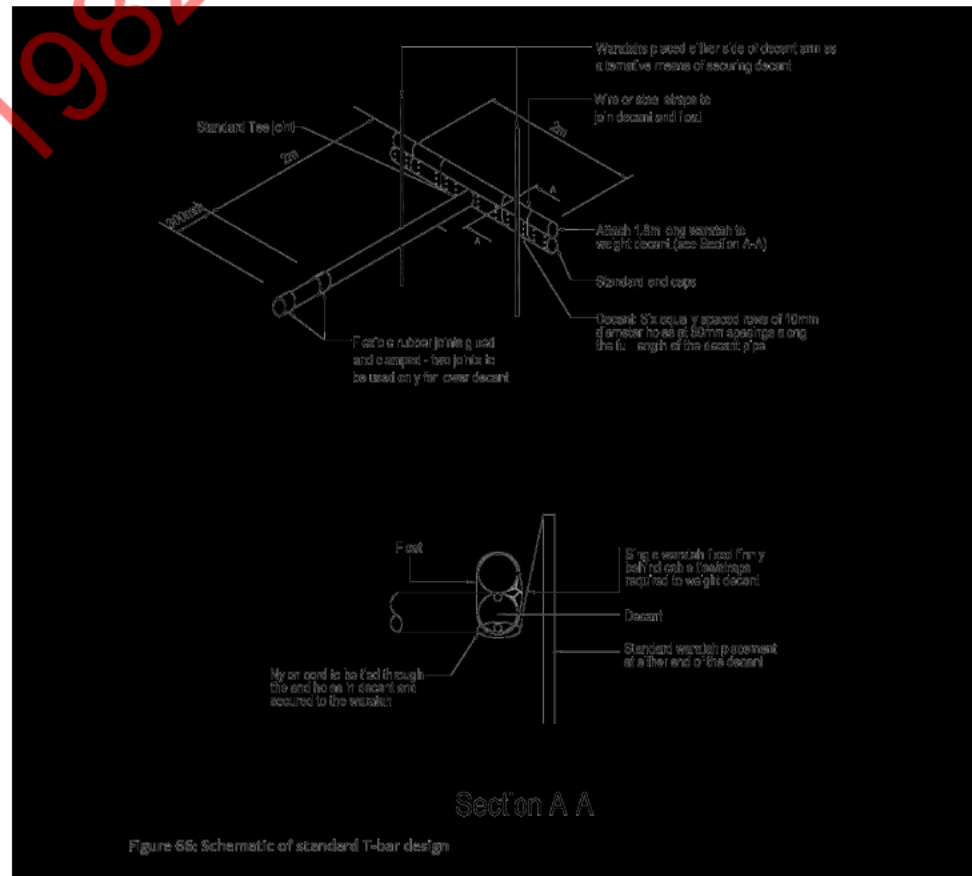


Figure 66: Schematic of standard T-bar design

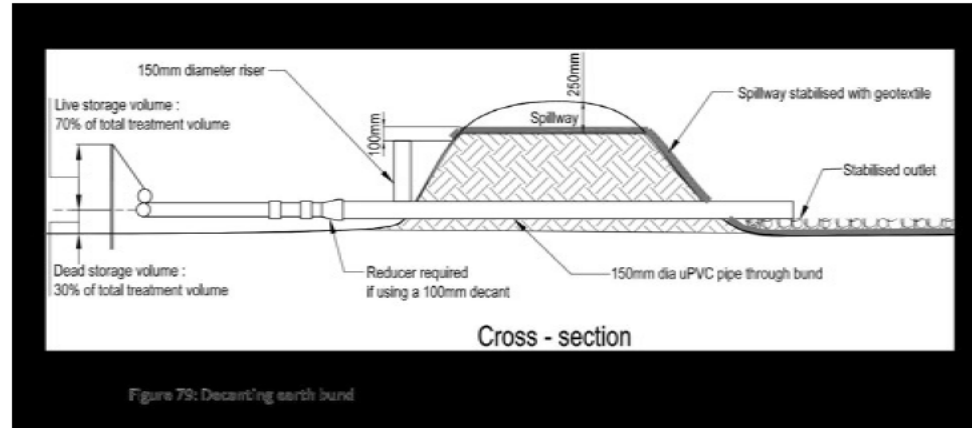


Figure 79: Decanting earth bund

Rev	Description	By	Date
A	FOR BULK EARTHWORKS APPROVAL	CK	11/19

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Job Title  
**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
SEDIMENT AND EROSION  
CONTROL DETAILS**

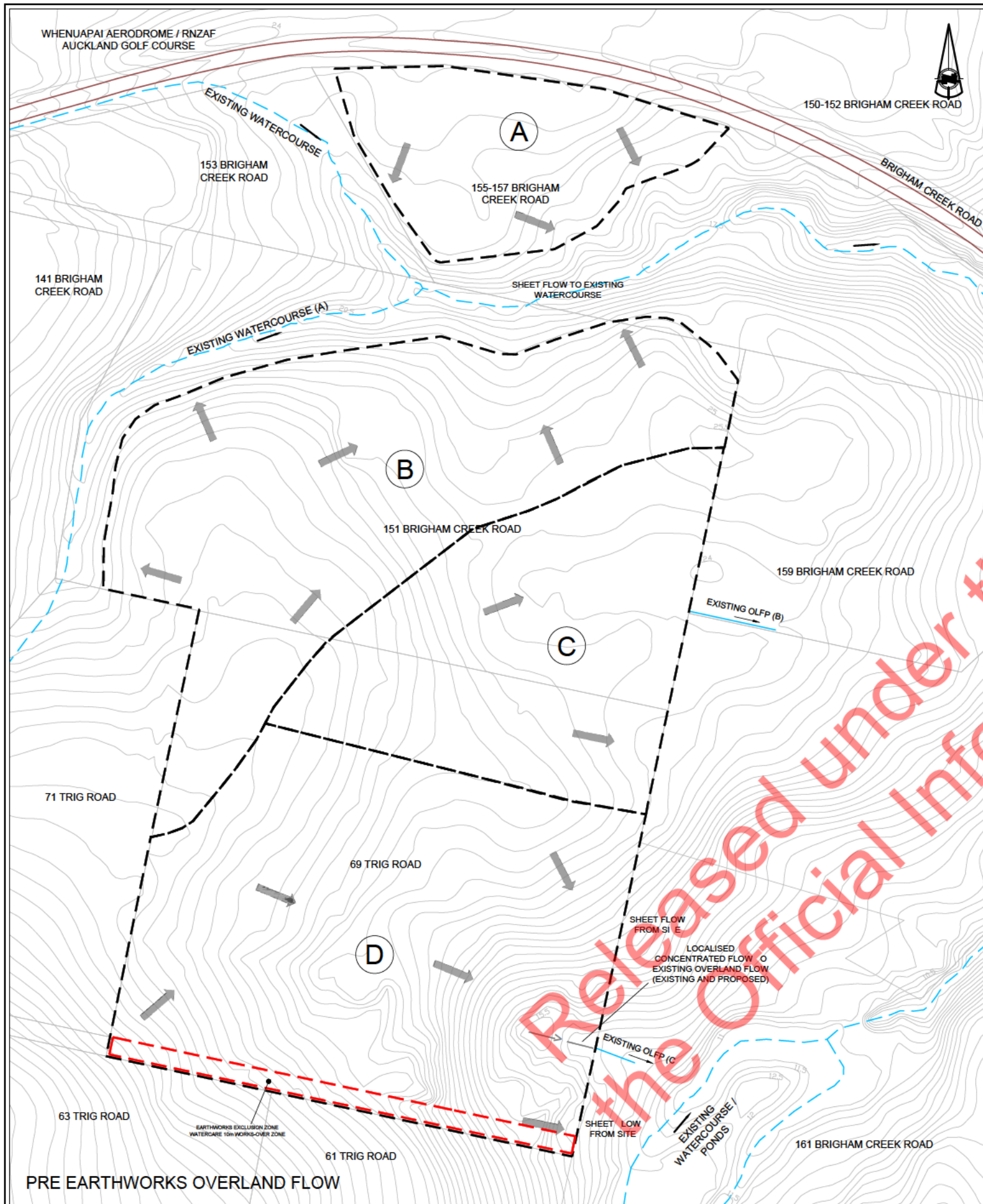
By	Date	Scale	Job No.	Rev
Survised: DS			Drawing No.	
Designed: CK			<b>447-01-BE-226</b>	<b>A</b>
Drawn: CK	11/19			
Approved: CK				
CAD FILE	F:\PROJECTS\BRIGHAM CREEK TRIG\DWG\ENG\BULK_EW\447-01-EW-220.dwg			






	By	Date	Scale	Job No.	
Surveyed:	DS		-	Drawing No.	Rev
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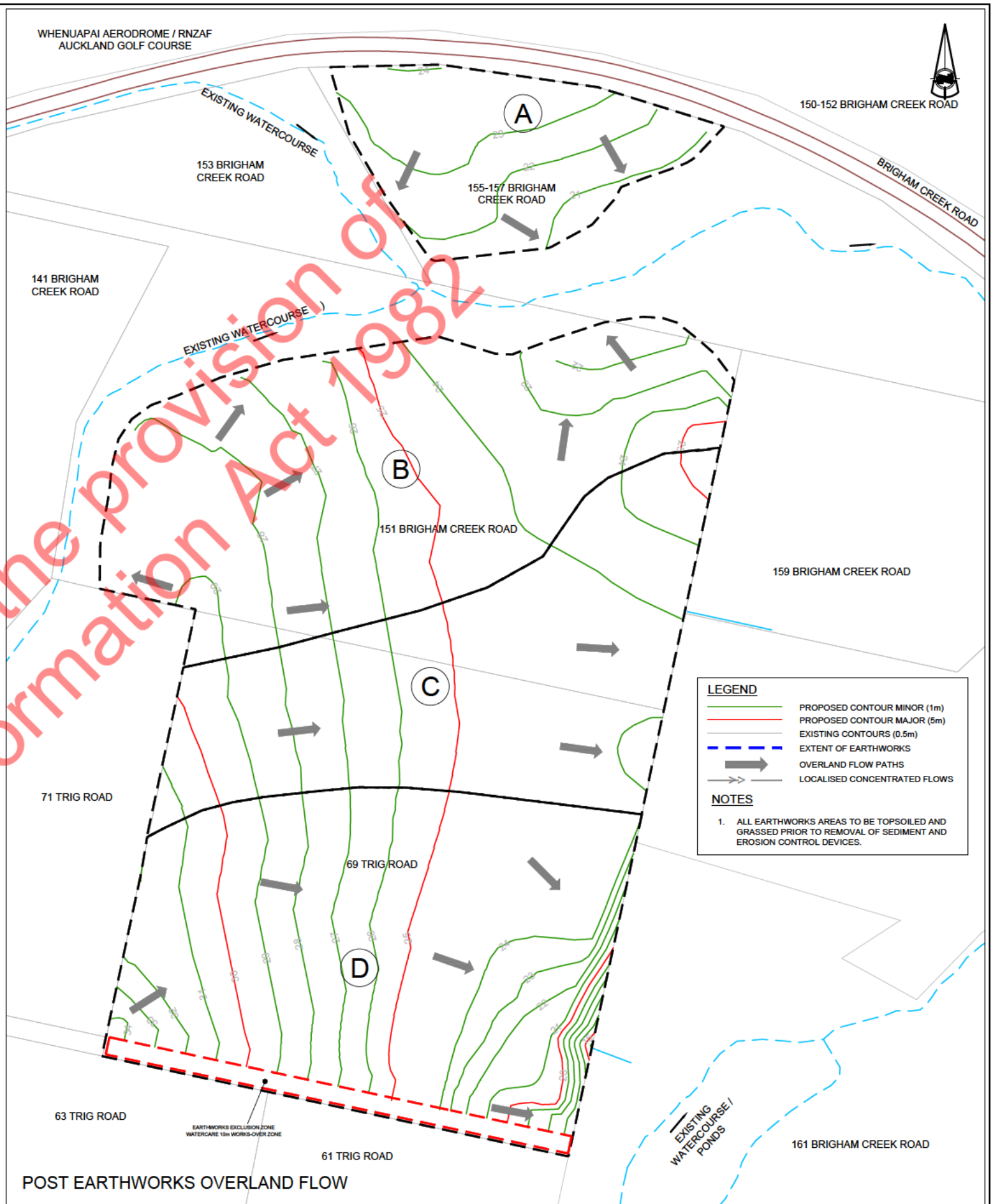
THE NEIL GROUP LIMITED  
LEVEL 3, BUILDING B  
8 HUGENT STREET  
GRAFTON

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Job Title  
**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
OVERLAND FLOW**

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Survised: DS		1:2500@A3	Drawing No.	
Designed: CK			<b>447-01-BE-250</b>	<b>A</b>
Drawn: CK	11/19			
Approved: CK				
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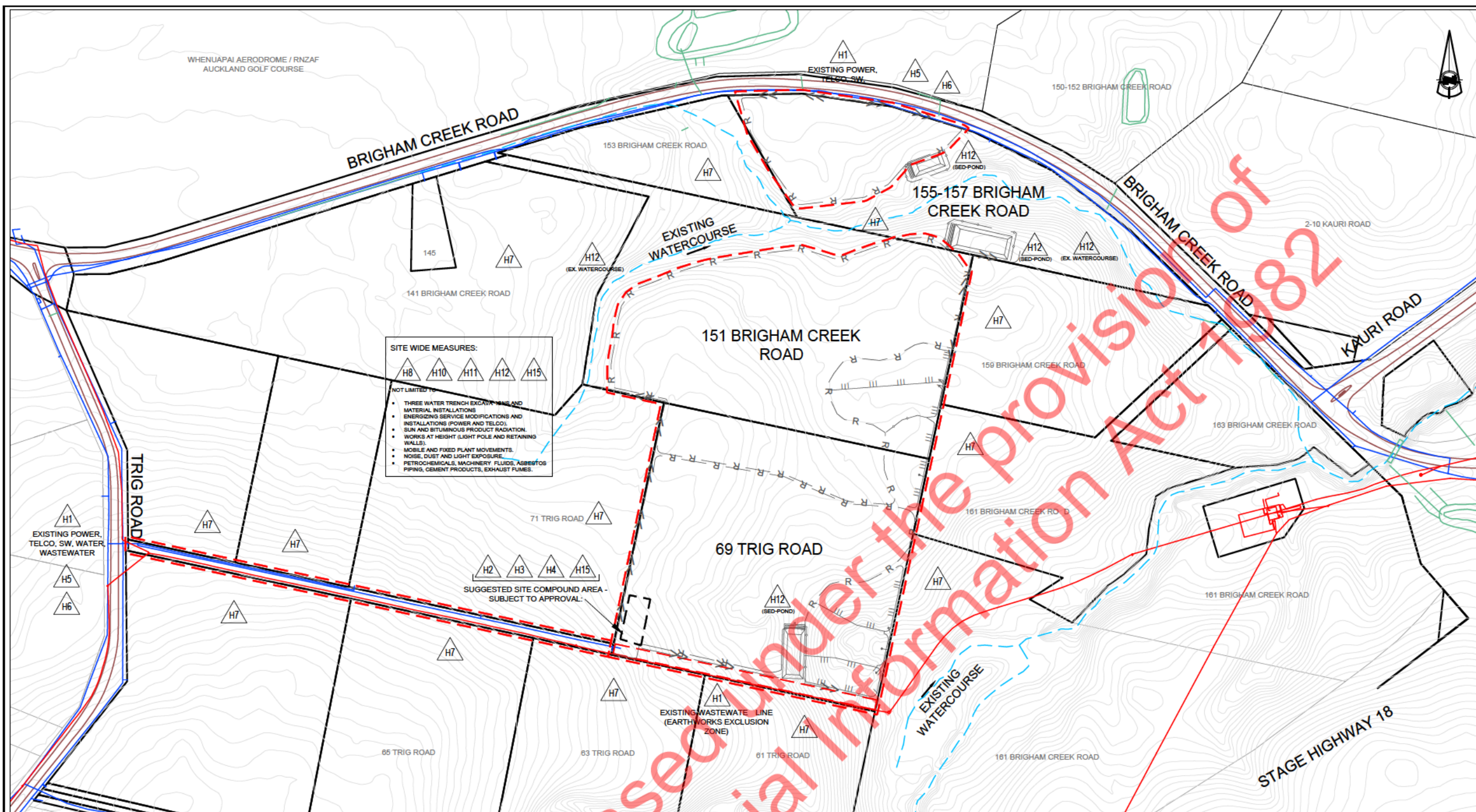
**LEGEND**

- PROPOSED CONTOUR MINOR (1m)
- PROPOSED CONTOUR MAJOR (5m)
- EXISTING CONTOURS (0.5m)
- EXTENT OF EARTHWORKS
- OVERLAND FLOW PATHS
- LOCALISED CONCENTRATED FLOWS

**NOTES**

- ALL EARTHWORKS AREAS TO BE TOPSOILED AND GRASSED PRIOR TO REMOVAL OF SEDIMENT AND EROSION CONTROL DEVICES.





## HEALTH AND SAFETY PROTECTION

<b>H1</b> EXISTING UNDERGROUND / OVERHEAD SERVICES SHOWN ON PLAN ✓ CONTRACTOR TO CONDUCT 'BYO' INQUIRY AND NOTIFY ALL AUTHORITIES TO LOCATE EXISTING SERVICES.	<b>H2</b> SITE INDUCTIONS EMPLOYEES / SUBCONTRACTORS & VISITORS SHOWN ON PLAN ✓ CONTRACTOR TO PROVIDE COMPLYING UP TO DATE HAZARD BOARD AND UNDERTAKE INDUCTIONS.
<b>H3</b> EMERGENCY PROCEDURES SHOWN ON PLAN ✓ CONTRACTOR TO RETAIN COMPLYING EMERGENCY PROCEDURES ONSITE.	<b>H4</b> ACCIDENT REPORTING SHOWN ON PLAN ✓ CONTRACTOR TO PROVIDE AND RETAIN ONSITE ACCIDENT REPORTING PROCEDURES AND RECORDS.
<b>H5</b> TRAFFIC MANAGEMENT SHOWN ON PLAN ✓ CONTRACTOR TO OBTAIN, PROVIDE AND MAINTAIN TRAFFIC MANAGEMENT AS PER CONSENTS AND BEST PRACTICES.	<b>H6</b> PUBLIC INTERFACE SHOWN ON PLAN ✓ CONTRACTOR TO MANAGE PUBLIC INTERFACE AND ENSURE NO UNAUTHORISED PUBLIC ACCESS TO SITE.
<b>H7</b> RESTRICTED AREAS SHOWN ON PLAN ✓ NO ACCESS WITHOUT PRIOR APPROVAL.	<b>H8</b> DUST & NOISE CONTROL SHOWN ON PLAN ✓ CONTROLS AS PER CONSENTS AND BEST PRACTICES.
<b>H9</b> MANAGEMENT OF CONTAMINATED MATERIALS SHOWN ON PLAN ✗ CONTROLS AS PER CONSENTS AND BEST PRACTICES.	<b>H10</b> OPERATING PLANT / MACHINERY SHOWN ON PLAN ✓ CONTROLS AS PER CONSENTS AND BEST PRACTICES.
<b>H11</b> EXCAVATIONS, CONFINED SPACES & VOIDS SHOWN ON PLAN ✓ CONTROLS AS PER CONSENTS AND BEST PRACTICES.	<b>H12</b> PONDS / WATER HAZARDS SHOWN ON PLAN ✓ CONTROLS AS PER CONSENTS AND BEST PRACTICES.
<b>H14</b> OTHER HAZARDS SHOWN ON PLAN ✓ IDENTIFIED ON PLANS IF APPLICABLE.	<b>H15</b> HAZARDOUS CHEMICAL STORAGE AND HANDLING SHOWN ON PLAN ✓ CONTROLS AS PER CONSENTS AND BEST PRACTICES.

## HEALTH AND SAFETY NOTES:

Before commencing work or allowing works to be undertaken onsite, the Contractor must have and provide:

- A Site Specific Health and Safety Plan which includes consideration of the hazard identified on this plan and any other potential hazards.
- Contractors Company Health & Safety policies, procedures and record form.
- Read, understood and signed the Neil Group Ltd's Contractor Health and Safety Handbook.
- Read, completed and signed the Neil Group Ltd Health & Safety Questionnaire (form 024)
- Read and understood Authority Consents, Contract Documents, Contract drawings and Specifications.
- Certificate of Currency of the following insurances: Public Liability, Professional Indemnity, Motor Vehicle Liability, Contractors Plant, at the sums specified in the contract documents.
- Induct Separate Sub-Contractors to the site and provide confirmation in writing of induction.
- All required contractor initiated consents. (Not limited to: Workspace Confined space approval, Approval CAR, Approved Watercare Entry Permits)

The design and specification of works has been carried out to minimise health and safety risks during construction activities. Should the Contractor consider that the design introduces unnecessary risks during construction, they shall notify the Engineer or Principal of their concerns.

The Contractor should also suggest alternatives or alterations to the design which would result in safer work practices

### LEGEND:

STORMWATER	—
WASTEWATER	—
WATER SUPPLY	—
TELCO	—
POWER	—
WORKS & ACCESS AREA	—
SEE DESIGN PLANS FOR OTHER SERVICE / ITEM SYMBOL DESCRIPTIONS AND LEGENDS	



FOR RESOURCES, GUIDES AND NEWS VISIT:

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[www.construction.worksafe.govt.nz](http://www.construction.worksafe.govt.nz)  
WORKSAFE: PH 0800 030 040

Rev	Description	By	Date
B	AC BEW S92 COMMENTS	CK	06/20
A	FOR BULK EARTHWORKS APPROVAL	CK	11/19

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Job Title  
**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
HEALTH & SAFETY MANAGEMENT  
(CONTRACT PRINCIPAL PROVIDED)**

By	Date	Scale	Job No.	Drawing No.	Rev
Survised: DS		1:4000@A3		447-01-BE-1000	B
Designed: CK					
Drawn: CK	11/19				
Approved: CK					
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