





THE SCOPE OF EARTHWORK SPECIFICATION RELATES ONLY TO EXCAVATION/BACKFILL WITHIN OPEN TRENCH WORKS, SURROUNDING MANHOLES, AND THE BACKFILL TO ORIGINAL CONDITIONS/DESIGN REQUIRED PROFILE.

**1. SITE VERIFICATION**

THE CONTRACTOR SHALL BE DEEMED TO HAVE REVIEWED THE GEOTECHNICAL FACTUAL REPORT AND HAVE READ AND UNDERSTOOD THE INFERRED GROUND CONDITIONS.

**2. SITE MANAGEMENT PLAN**

THE CONTRACTOR SHALL PREPARE AN EARTHWORKS MANAGEMENT PLAN PRIOR TO THE COMMENCEMENT OF WORKS AND INCLUDING EROSION AND SEDIMENT CONTROL AND DUST CONTROL. THE MANAGEMENT PLAN SHOULD MAKE REFERENCE TO LOCAL AUTHORITY REQUIREMENTS. THIS PLAN SHALL BE SUBMITTED TO THE LOCAL AUTHORITY AND APPROVED PRIOR TO COMMENCING ANY EARTHWORKS.

**3. PRIOR TO COMMENCEMENT OF CONSTRUCTION**

EXISTING SERVICES

BEFORE COMMENCEMENT OF EXCAVATION, THE CONTRACTOR SHALL ASCERTAIN THE LOCATION OF THE EXISTING SERVICES WITHIN THE WORK AREAS OR AREAS LIKELY TO BE AFFECTED BY THE WORK AND DRAINAGE FOR THEIR CONNECTION AND DIVERSION.

INSTRUCTIONS OR INFORMATION GIVEN TO THE CONTRACTOR BY THE ENGINEER OR SHOWN ON THE DRAWINGS, SHALL IN NO WAY RELEASE HIM FROM LIABILITIES UNDER THIS CLAUSE.

WHEN TRENCHING AND EXCAVATING, CARE IS TO BE TAKEN NOT TO DAMAGE EXISTING DRAINS, WATER MAINS, CABLES, ETC. IF IN SERVICE. SHOULD ANY DAMAGE OCCUR, THE ENGINEER AND LOCAL AUTHORITY SHALL BE NOTIFIED AT ONCE AND THE DAMAGE MADE GOOD.

SURFACE DRAINAGE

TEMPORARY SURFACE DRAINAGE SHALL BE CONSTRUCTED BY THE CONTRACTOR TO MAINTAIN THE NATURAL DRAINAGE AND LIMIT THE INTRODUCTION OF WATER TO THE EARTHWORKS.

**4. FILL MATERIAL DEFINITION**

GRANULAR FILL

DEFINED AS A WELL GRADED, DURABLE, GRANULAR AGGREGATE WHICH CONTAINS SPECIFIED FINES AND WHICH MEETS SPECIFIED GRADING, STRENGTH, AND DURABILITY CRITERIA AS DEFINED BELOW:

- GRADINGS FOR GAP65, GAP40 AND GAP20 ARE TO CONFORM TO THOSE SPECIFIED IN THE SUMMARY TABLE1
- FREE DRAINING GRANULAR MATERIAL SHALL BE IMPORTED CRUSHED AND GRADED CLEAN MATERIAL, PREFERABLY, WELL GRADED OR UNIFORM, WITH 100% PASSING A 10MM SIEVE, AND 15% PASSING A 0.5MM SIEVE OR OTHER SIMILAR APPROVED.
- IF THE MATERIAL AND GRADING IS NOT SPECIFIED ELSEWHERE, HARDFILL MATERIAL SHALL BE GAP65 MATERIAL OR FILL APPROVED BY THE ENGINEER.

THE CONTRACTOR IS TO SUPPLY THE FOLLOWING DATA RELATED TO THE PROPOSED BACKFILL MATERIALS FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION:

- ADDRESS OF THE SOURCE QUARRY;
- THE GEOLOGICAL DESCRIPTION OF THE PARENT MATERIAL;
- THE CONTRACTOR SHALL PROVIDE A PARTICLE SIZE DISTRIBUTION TEST, COMPACTION TEST AND BROKEN FACE PERCENTAGE TEST RESULTS FROM A REPRESENTATIVE GRAVEL FILL SAMPLE TESTED IN AN INDEPENDENT AND ACCREDITED LABORATORY.
- RESULTS OF COMPACTION TESTS AS SPECIFIED IN NZS 4402:1988 – TEST 4.1.1 OR TEST 4.1.3 ARE TO BE CARRIED OUT ON THE PROPOSED BACKFILL AND THE RESULTS PRESENTED TO THE ENGINEER FOR AGREEMENT PRIOR TO CONSTRUCTION. THESE ARE TO CLEARLY SHOW THE OPTIMUM MOISTURE CONTENT AND MAXIMUM DENSITY ACHIEVED.

BASED ON THE ABOVE DETAILS, THE CONTRACTOR IS TO AGREE THE METHOD OF COMPACTION WITH THE DESIGNER PRIOR TO COMMENCEMENT OF CONSTRUCTION ON SITE.

COHESIVE FILL

DEFINED AS MATERIAL COMPRISED PREDOMINANTLY CLAY AND SILT WITH NON-GRANULAR COMPOSITE.

CLEAN FILL

CLEANFILL MATERIAL IS MATERIAL THAT DOES NOT UNDERGO ANY PHYSICAL, CHEMICAL, OR BIOLOGICAL TRANSFORMATIONS THAT WILL CAUSE ADVERSE ENVIRONMENTAL EFFECTS OR HEALTH EFFECTS ONCE IT IS PLACED IN THE GROUND. CLEANFILL MATERIAL HAS NO POTENTIALLY HAZARDOUS CONTENT AND MUST NOT BE CONTAMINATED BY OR MIXED WITH ANY OTHER NON-CLEANFILL MATERIAL.

UNSUITABLE

DEFINED AS MATERIAL NOT CONSIDERED ACCEPTABLE FOR THE USE AS ENGINEERING FILL WITHIN THE BACKFILL OF THE TRENCH EXCAVATIONS AND/OR ACCESS PLATFORM. THIS WILL COMPRISE:

- o OVERLY ORGANIC / ORGANIC MATERIAL / TOPSOIL
- o NON-ENGINEERED FILL THAT CANNOT BE RECONDITIONED
- o OVERLY SATURATED MATERIAL THAT CANNOT BE RECONDITIONED
- o REFUGE/RUBBISH

SITE WON MATERIAL

MATERIAL THAT IS IN-SITU, AND EXCAVATED FOR CONTRACT WORKS. THIS MATERIAL CAN BE CONDITIONED (DRIED, DISCED

AND BLENDED) AND BE PLACED AS PART OF SITE EARTHWORK TO MEET COMPACTION REQUIREMENTS.

ACCEPTABLE MATERIAL

ACCEPTABLE FILL IS TO BE USED FOR EARTHWORKS WHICH COMPRISES THE FOLLOWING MATERIALS LISTED BELOW FOR VARIOUS AREAS. IN ADDITION, MINIMUM STRENGTHS ALSO REQUIRED TO BE ACHIEVED, AS DEFINED IN SECTIONS 8 & 9 OF THIS SPECIFICATION.

- a) TRENCH BACKFILL
  - o CLEAN FILL (COHESIVE), WON 100% FROM SITE AND REUSED/RECONDITIONED
  - o IMPORTED FILL (COHESIVE), 100% OFFSITE, AND USED
  - o MIXED/CONDITIONED FILL (COHESIVE), COMPRISING BOTH LOCALLY WON AND IMPORTED (SECTION 7 FOR CONDITIONING NOTES).
- b) MANHOLES
  - o CLEAN IMPORTED GRANULAR FILL, GAP65 OR EQUIVALENT (FOR BULK BACKFILLING OF MANHOLE TRENCH EXCAVATIONS ONLY) OR SAND

**5. EXCAVATION – PIPE TRENCH AND MANHOLE**

GENERAL REQUIREMENTS

- a) THE BOTTOM OF THE EXCAVATIONS SHALL BE FORMED ON SUITABLE NATURAL MATERIAL AS AGREED BY THE CONTRACTOR AND ENGINEER, AND BE SUITABLY SHORED IF NEEDED TO ALLOW HORIZONTAL PLACEMENT OF FILL. THE ENGINEER MAY REQUIRE ADDITIONAL EXCAVATION TO REMOVE ANY POCKETS OF SOFT SOIL, UNSUITABLE MATERIAL, OR LOOSE ROCK.
- b) TRENCH EXCAVATION SHOULD BE STAGED. MAXIMUM EXCAVATION OF TRENCH EXCAVATION SHOULD BE NO MORE THAN 10 M IN LENGTH EACH STAGE.
- c) EXCAVATION FOR THE PARTICULAR SECTION OF OPEN TRENCH WORK SHALL NOT COMMENCE UNTIL THE CORRESPONDING ADJACENT SECTION OF IN-GROUND RETAINING WALL HAS BEEN CONSTRUCTED AND A MINIMUM OF 7 DAYS HAS LAPSED SINCE THE CONCRETE HAS BEEN POURED
- d) THE EXCAVATIONS SHALL BE KEPT FREE OF WATER.
- e) NO WORK SHALL BE CARRIED OUT UPON PREPARED EXCAVATION SURFACES UNTIL THE ENGINEER HAS APPROVED THE PREPARED SURFACES.
- f) TEMPORARY AND PERMANENT CUT SLOPES SHALL BE ADEQUATELY PROTECTED.
- g) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EFFECT OR DAMAGE THE TEMPORARY WORKS MAY HAVE UPON OR WHICH MAY BE CAUSED TO THE WORKS, ANY EXISTING STRUCTURES OR ANY SURROUNDING PROPERTY AND FOR ANY EFFECT OR DAMAGE THAT MAY BE CAUSED BY THE EXCAVATION OR DISPOSAL OF EXCAVATED MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LANDSLIPS IN THE EXCAVATION AND ANY INJURIOUS EFFECTS CAUSED THEREBY AND SHALL MAKE GOOD ALL SUCH DAMAGE WHETHER TO THE WORKS, THE ADJOINING PROPERTY OR ADJACENT STRUCTURES TO THE SATISFACTION OF THE ENGINEER AND / OR LOCAL REGULATORY AUTHORITY.
- h) THE CONTRACTOR SHALL EMPLOY ONLY THOSE PLANT AND WORKING METHODS WHICH ARE SUITED TO THE MATERIALS TO BE HANDLED AND TRAVERSED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE NATURE OF THE SUITABLE MATERIAL SO THAT WHEN IT IS PLACED AND COMPACTED IT REMAINS ACCEPTABLE.

EXCAVATION IN SOIL, NON ENGINEERED FILL AND ROCK

THE CONTRACTOR SHALL ACCOUNT FOR ALL MATERIALS ENCOUNTERED, THAT COULD REASONABLY BE ANTICIPATED FROM THE GEOTECHNICAL INFORMATION PROVIDED. THIS SHALL INCLUDE VARIABLE MATERIAL IN THE NON-ENGINEERED FILL.

EXCAVATION SUPPORT

THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT WHERE NECESSARY. AS A MINIMUM, IT IS EXPECTED THAT ANY PROPOSED TRENCH IS PROTECTED BY TRENCH SHIELDS DURING EXCAVATION AND ALL PROPOSED MANHOLE / LAUNCH-RETRIEVAL SHAFTS BE SUPPORTED BE ADEQUATE STEEL RING CAISSONS. .

ALTERNATIVE SUPPORT MAY BE PROVIDED BY THE CONTRACTORS ENGINEER, SUBJECT TO PRIOR APPROVAL / VERIFICATION FROM THE DESIGN ENGINEER.

**6. FILL CONDITIONING**

FOR COHESIVE FILL, IN THE EVENT THAT SITE WON MATERIAL OR IMPORTED MATERIAL IS OVERLY SATURATED, REQUIRES BLENDING, OR DOES NOT DISPLAY SUFFICIENT PLASTICITY FOR ACHIEVING PROPER COMPACTION, THE CONTRACTOR MAY CONSIDER CONDITIONING OF THE MATERIAL PRIOR TO PLACEMENT AS ACCEPTABLE FILL. CONDITIONING INCLUDING SPECIFIC METHODOLOGIES SHOULD BE DISCUSSED AND AGREED BY THE CONTRACTOR AND THE DESIGNER AS REQUIRED, AT THE TIME.

**7. PLACEMENT AND COMPACTION OF FILL – TRENCH AND MANHOLE EXCAVATION**

- a. THE GENERAL PRINCIPLE TO BE ACHIEVED IN BACKFILLING OF THE TRENCH IS TO MAINTAIN AS BEST AS PRACTICAL THE ORIGINAL PERMEABILITY OF THE SOILS BELOW THE SLOPE. APPROVED LOCALLY WON MATERIAL, IMPORTED OR BLENDED MATERIAL MAY BE USED.
- b. PIPE BEDDING REQUIREMENTS SHOULD BE FOLLOWED AS PER PIPE DESIGN AND AS SPECIFIED ON DRAWING R0017910.010.

FOR TRENCH BACKFILL WORKS:

- a) MATERIAL TO COMPRISE COHESIVE, PREFERABLY LOCALLY WON, IMPORTED OR BLENDED (AT THE DIGRESSION OF THE DESIGN ENGINEER).
- b) RECONDITIONING OF LOCALLY WON MATERIAL OK, PROVIDED SITE PLATEAU TESTING AND/OR LABORATORY TESTING OF SAMPLE CAN BE PERFORMED AND PROVIDED BY CONTRACTOR

- c) PLACEMENT OF FILL IN LOOSE LAYERS NOT EXCEEDING 200 MM
- d) COMPACTION VIA THE USE OF MACHINE PLANT, SUFFICIENTLY WEIGHTED AND WITH A STUDED SURFACE, I.E. A PAD-FOOT OR EQUIVALENT. FLAT PLATES NOT TO BE USED.
- e) CARE TO BE TAKEN DURING THE FIRST 1-2 LIFTS ABOVE THE PIPE BEDDING MATERIAL TO AVOID DAMAGE TO THE UNDERLYING PIPE
- f) COMPACTION OF THE TRENCH BACKFILL SHOULD ACHIEVE THE MINIMUM STRENGTH VALUES (TO BE VERIFIED ON SITE): COMPACTION REQUIREMENTS AS SET OUT BELOW:
  - o 5% AIR VOIDS
  - o TESTING AT NOMINAL LOCATIONS ALONG TRENCH, AND MINIMUM ONE TEST APPROXIMATELY HALF WAY UP, AND ONE AT FINISH LEVEL.

FOR MANHOLE BACKFILL:

- a) USE OF APPROPRIATELY SIZED GRANULAR FILL ACCEPTABLE
- b) TO BE COMPACTED IN LOOSE LAYERS NOT EXCEED TWICE THE AVERAGE PARTICLE DIAMETER
- c) USE OF VIBRATION COMPACTING EQUIPMENT
- d) ALTERNATIVELY THE USE OF SAND BACKFILL MAY BE CONSIDERED, IF COMPACTION OF GRANULAR FILL DEEMED IMPRACTICAL WITH THE SITE CONSTRAINTS

**8. COMPACTION TESTING**

COMPACTION REQUIREMENTS

ONE "SET" OF NUCLEAR DENSOMETER TESTS (WHERE ONE "SET" = 3 INDIVIDUAL TESTS) IS TO BE CARRIED OUT FOR EACH 30M<sup>3</sup> OF FILL PLACED. 95% OF THE TESTS CARRIED OUT MUST MEET THE REQUIRED DENSITY SPECIFICATION."

WHERE FIELD TESTS INDICATE THAT THE SPECIFIED STANDARD OF COMPACTION HAS NOT BEEN ACHIEVED, CORRECTIVE ACTION SHALL BE TAKEN TO BRING THE FILL TO THE REQUIRED STANDARD AND AS REQUIRED BY THE ENGINEER. THIS MAY REQUIRE EXCAVATION AND REMOVAL OF THE FAILED FILL.

COMPACTION STANDARDS

AT ANY TIME EITHER PRIOR TO OR DURING THE COURSE OF CONSTRUCTION, THE ENGINEER MAY DIRECT MODIFICATIONS TO THE FOLLOWING COMPACTION CRITERIA, WITH THE OBJECT OF ENSURING THAT THE COMPACTION CRITERIA FOR THE PARTICULAR MATERIALS AND CONDITIONS BEING ENCOUNTERED OR LIKELY TO BE ENCOUNTERED ARE ACHIEVED.

**9. FILL CONTROL AND TEST METHODS**

GENERAL


NUCLEAR DENSOMETER TESTS WILL BE USED TO DETERMINE THE CLASSIFICATION AND COMPACTION STANDARDS OF FILL MATERIALS. APPROXIMATE TEST METHODS, SUCH AS A HAND SHEAR VANE, MAY BE EMPLOYED TO OBTAIN RAPID INDICATIVE RESULTS, BUT APPROXIMATE METHODS SHALL NOT BE USED FOR ACCEPTANCE PURPOSES WHERE THE ADEQUACY OF MATERIALS, PROCESSING OR WORKMANSHIP IS IN DOUBT OR THE AMOUNT BY WHICH THE TEST RESULT FAILS WITHIN THE CONFIDENCE LIMITS OF THE APPROXIMATE TEST RESULT. NUCLEAR DENSOMETER SHOULD BE COMPLETED IN ACCORDANCE WITH TEST METHOD NZS4407 TEST 4.2.1 AND BE CALIBRATED IN ACCORDANCE WITH TEST 4.2.4 OF NZS4407: 1991 AT A FREQUENCY NOT EXCEEDING 2 YEARS IN AN IANZ ACCREDITED LABORATORY.

PRIOR TO PLACEMENT OF FILL, CONTRACTOR IS TO OBTAIN A SITE SPECIFIC BULK HEAVY COMPACTION TEST FOR EACH REPRESENTATIVE FILL MATERIAL PROPOSED TO BE USED. A MINIMUM OF 1 TEST PER MATERIAL IS REQUIRED. THE TESTING SHALL BE CARRIED OUT BY A IANZ VERIFIED LABORATORY. THE RESULTS SHALL BE PROVIDED TO THE DESIGN ENGINEER FOR REVIEW PRIOR TO COMPACTION COMMENCING.

GAP 65	PERCENTAGE PASSING		GAP40	PERCENTAGE PASSING		GAP20	PERCENTAGE PASSING	
	LOWER LIMIT	UPPER LIMIT		LOWER LIMIT	UPPER LIMIT		LOWER LIMIT	UPPER LIMIT
APERTURE SIZE(MM)	LOWER LIMIT	UPPER LIMIT	APERTURE SIZE(MM)	LOWER LIMIT	UPPER LIMIT	APERTURE SIZE(MM)	LOWER LIMIT	UPPER LIMIT
65	100	100	37.5	100	100	19	100	100
37.5	80	90	19	61	80	13.2	80	95
19	50	70	9.5	38	57	9.5	64	76
9.5	30	55	4.75	23	43	4.75	37	48
4.75	20	40	2.36	10	33	2.36	26	36
2.36	15	30	1.18	7	25	1.18	18	28
1.18	10	22	0.6	2	19	0.6	12	22
0.6	6	18	0.3	0	14	0.3	6	14
0.3	4	14	0.15	0	10	0.15	2	7
0.15	2	10	0.075	0	7	0.075	0	3
0.075	0	7						

**DETAILED DESIGN  
NOT FOR CONSTRUCTION**

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	PH	DATE
					DESIGNED	PH	12-21
					DES. APPROVED	SW	12-21
					DRAWN	DX	12-21
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.		DWG. APPROVED	JC	12-21
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.		WSL DESIGN MGMT.		
1	5-21	ISSUED FOR PRELIMINARY DESIGN	D.X.		WSL PROJ. LEAD		




**Watercare**

COPYRIGHT – This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

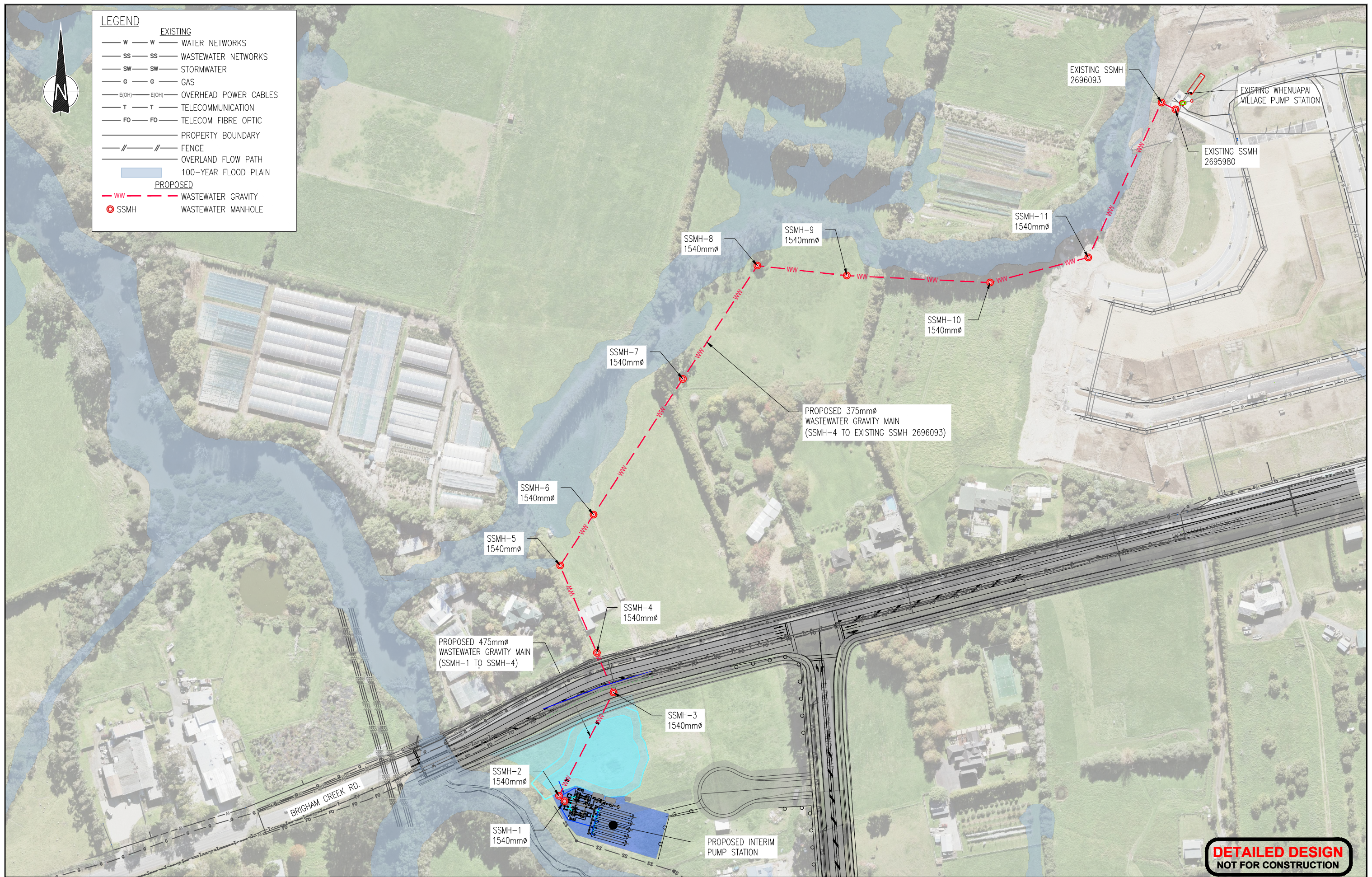
**WHENUAPAI-REDHILLS WASTEWATER SERVICING**

**BRIGHAM CREEK ROAD, WHENUAPAI**

**INTERIM SLAUGHTERHOUSE PS – GRAVITY MAIN – GENERAL NOTES**



CAD FILE	R0017910.003	DATE	10-12-21
ORIGINAL SCALE	A3	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	R0017910.003	ISSUE	3



**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	

DESIGNED	PH	DATE	DES. APPROVED	SW	DATE	DRAWN	JC	DATE	DWG. APPROVED	DJ	DATE	WSL DESIGN MGMT.	WSL PROJ. LEAD
		12-21			12-21			12-21			12-21		

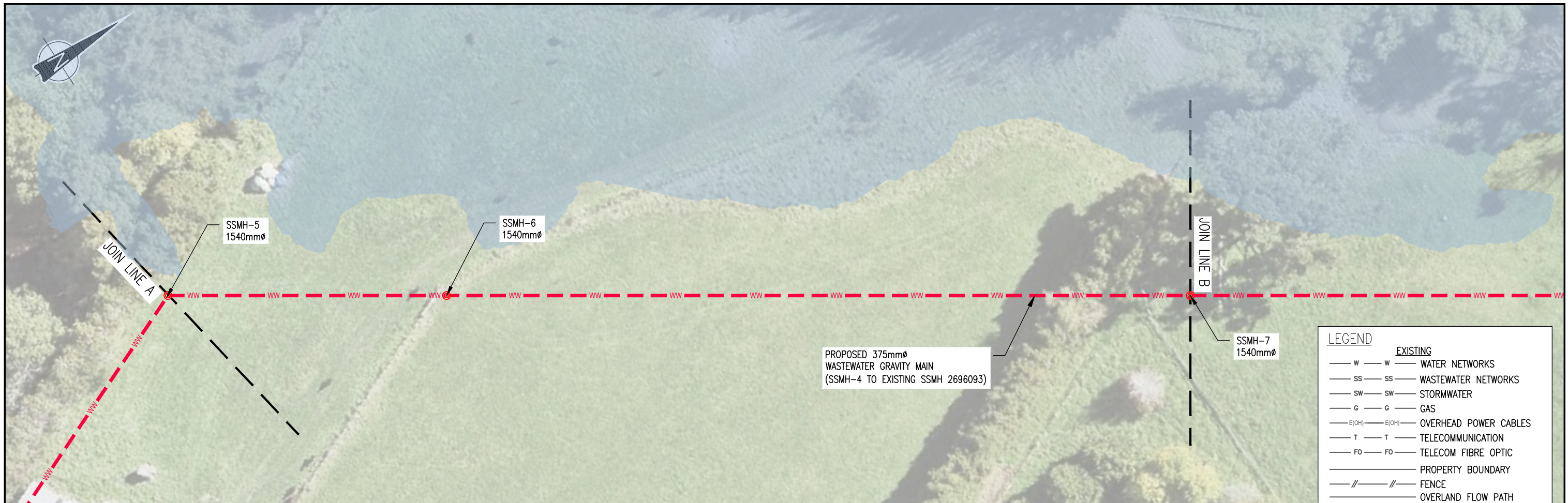
**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER GRAVITY MAIN - GENERAL LAYOUT



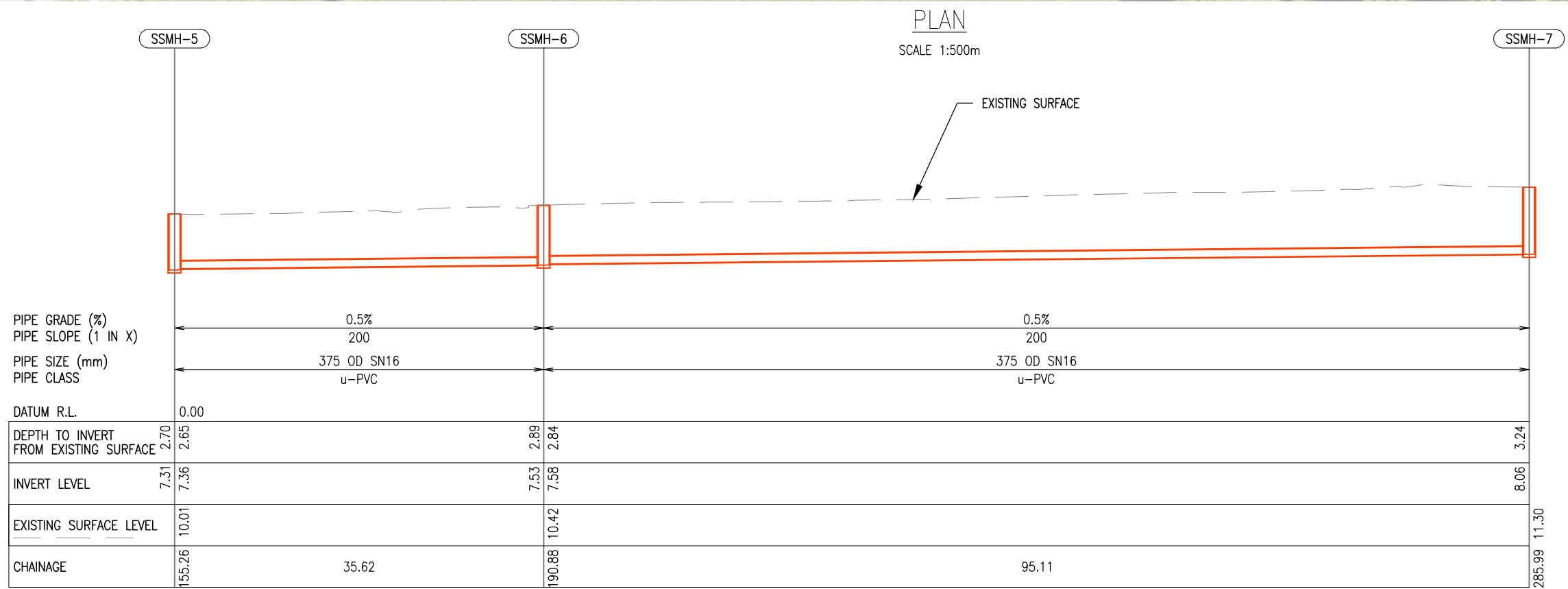
CAD FILE	R0017910.002	DATE	10-12-21
ORIGINAL SCALE	A3	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	R0017910.004	ISSUE	3





LEGEND	
<b>EXISTING</b>	
— w — w —	WATER NETWORKS
— ss — ss —	WASTEWATER NETWORKS
— sw — sw —	STORMWATER
— g — g —	GAS
— E(OH) — E(OH) —	OVERHEAD POWER CABLES
— T — T —	TELECOMMUNICATION
— FO — FO —	TELECOM FIBRE OPTIC
— — —	PROPERTY BOUNDARY
— // — // —	FENCE
— — —	OVERLAND FLOW PATH
— — —	100-YEAR FLOOD PLAN
<b>PROPOSED</b>	
— ww — ww —	WASTEWATER GRAVITY
⊙ SSMH	WASTEWATER MANHOLE

**NOTE:**  
1. 1540MM MANHOLES TO BE IN ACCORDANCE WITH WSL STANDARD DRAWING 2000244.012.



**LONG SECTION**  
SCALE 1:500(H), 1:250(V)

**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	PH	DATE
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.		DES. APPROVED	SW	12-21
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.		DRAWN	JC	12-21
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.		DWG. APPROVED	DJ	12-21
					WSL DESIGN MGMT.		
					WSL PROJ. LEAD		

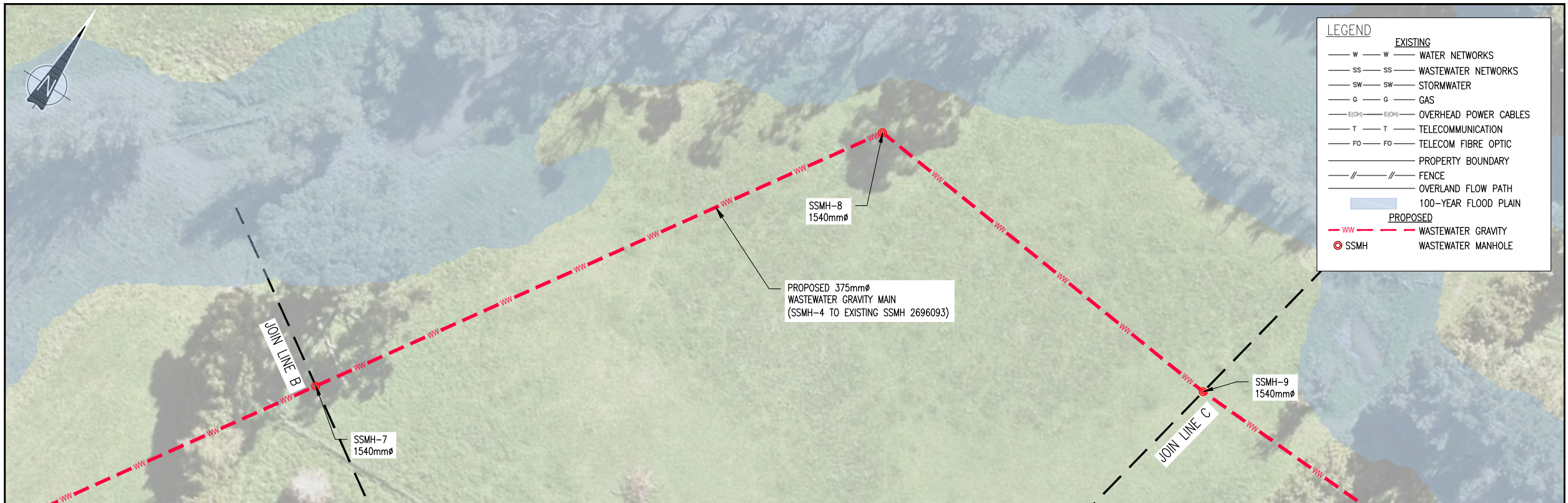
**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

**WHENUAPAI-REDHILLS WASTEWATER SERVICING**  
**BRIGHAM CREEK ROAD, WHENUAPAI**

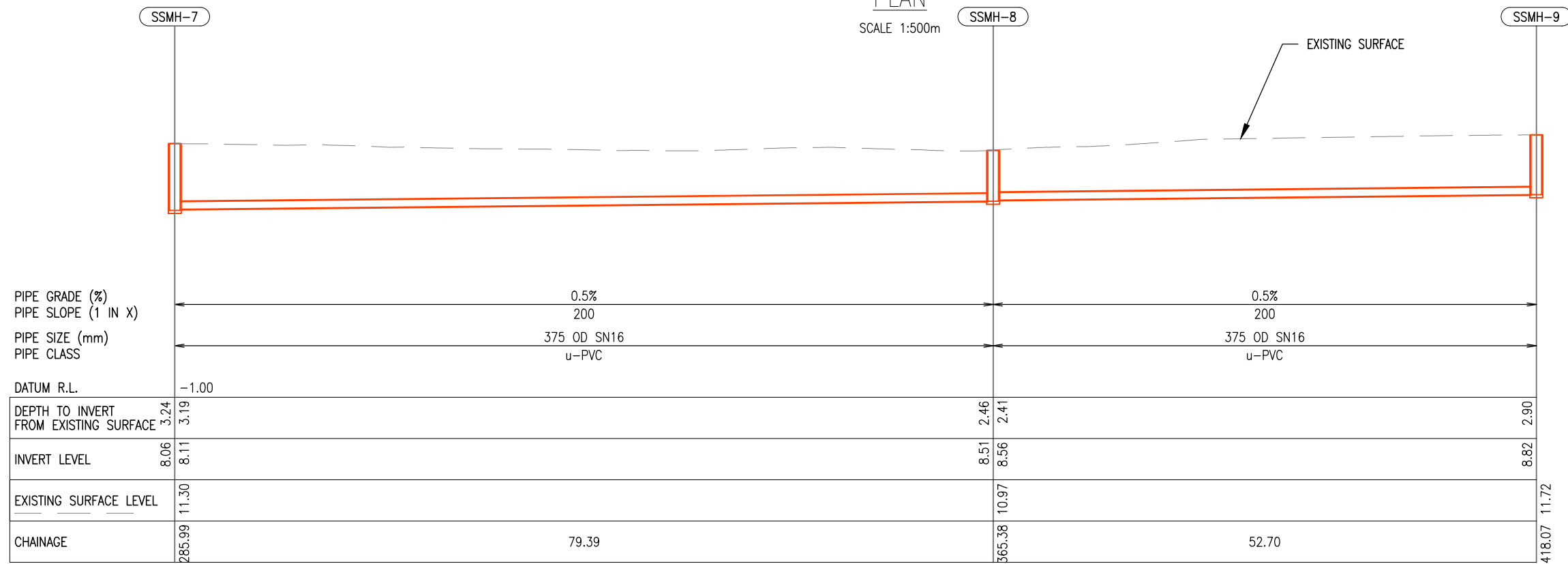
INTERIM SLAUGHTERHOUSE PS - WASTEWATER GRAVITY MAIN PLAN AND LONG SECTION - SHEET 2 OF 5



CAD FILE	R0017910.002	DATE	10-12-21
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	R0017910.006	ISSUE	3



PLAN  
SCALE 1:500m



LONG SECTION  
SCALE 1:500m(H), 1:250(V)

**NOTE:**  
1. 1540MM MANHOLES TO BE IN ACCORDANCE WITH WSL STANDARD DRAWING 2000244.012.

**DETAILED DESIGN  
NOT FOR CONSTRUCTION**

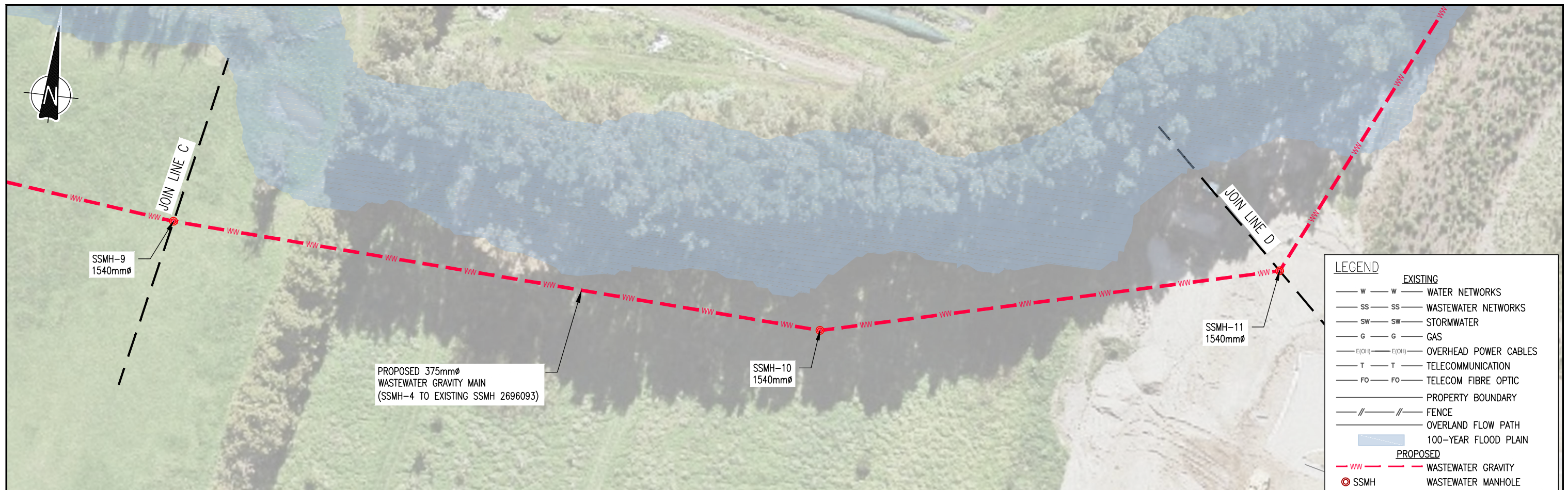
ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	PH	DATE
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.		DES. APPROVED	SW	12-21
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.		DRAWN	JC	12-21
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.		DWG. APPROVED	DJ	12-21
					WSL DESIGN MGMT.		
					WSL PROJ. LEAD		

COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

**WHENUAPAI-REDHILLS WASTEWATER SERVICING**  
**BRIGHAM CREEK ROAD, WHENUAPAI**  
 INTERIM SLAUGHTERHOUSE PS - WASTEWATER GRAVITY MAIN PLAN AND LONG SECTION- SHEET 3 OF 5

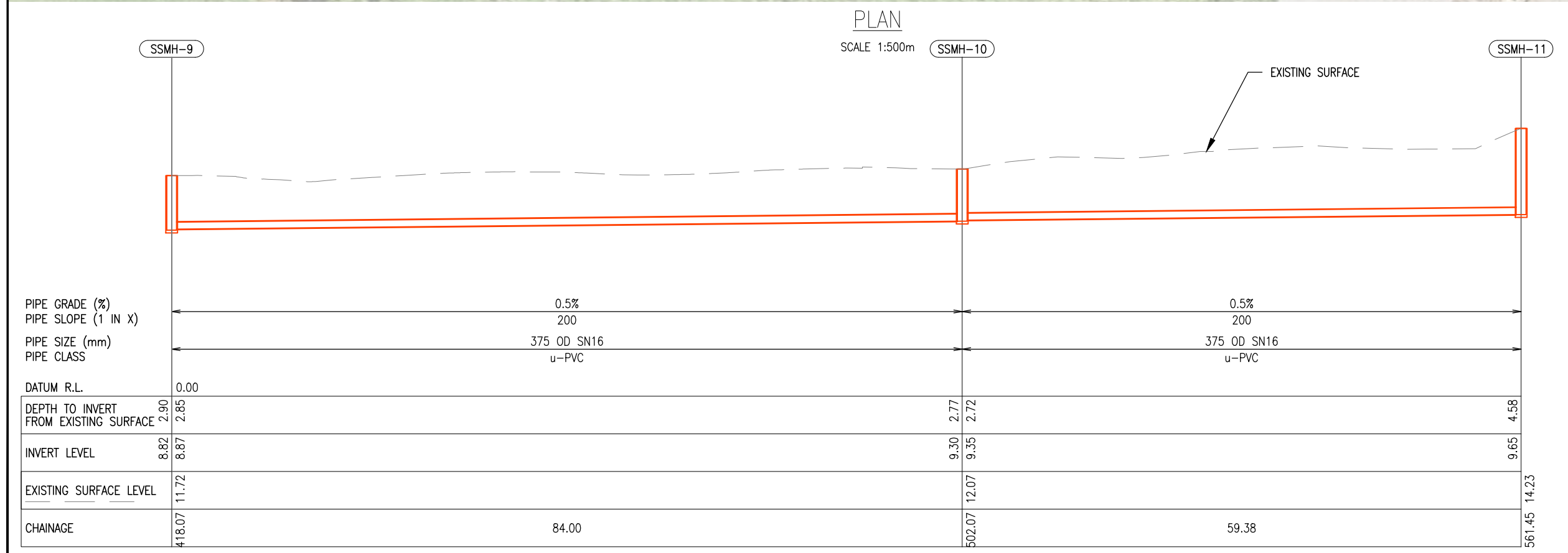


CAD FILE	R0017910.002	DATE	10-12-21
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	R0017910.007	ISSUE	3



**NOTE:**

1. 1540MM MANHOLES TO BE IN ACCORDANCE WITH WSL STANDARD DRAWING 2000244.012.

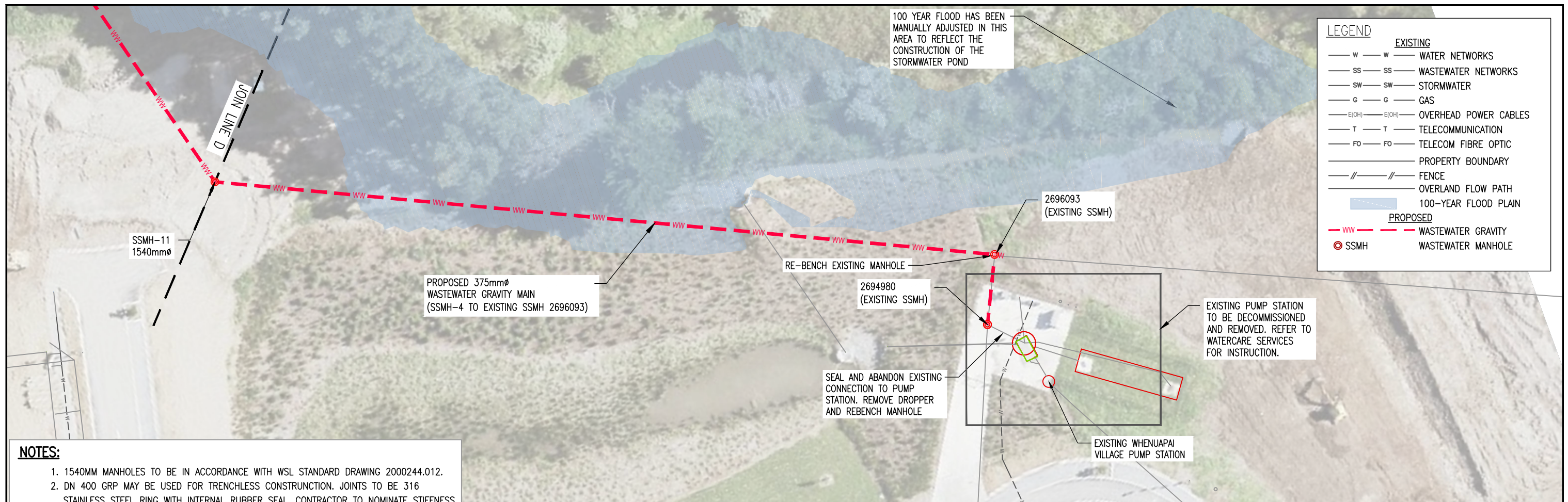


**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

		DESIGNED	PH	12-21	<p>COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.</p>		CAD FILE	R0017910.002	DATE	10-12-21	
		DES. APPROVED	SW	12-21			ORIGINAL SCALE	A3	1:500	CONTRACT No.	6484-6934
		DRAWN	JC	12-21			REF No.	12508391   3-AWD32			
		DWG. APPROVED	DJ	12-21			DWG No.	R0017910.008			
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.							ISSUE	3
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.								
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.								
ISSUE	DATE	AMENDMENT	BY	APPD.	BY	DATE					

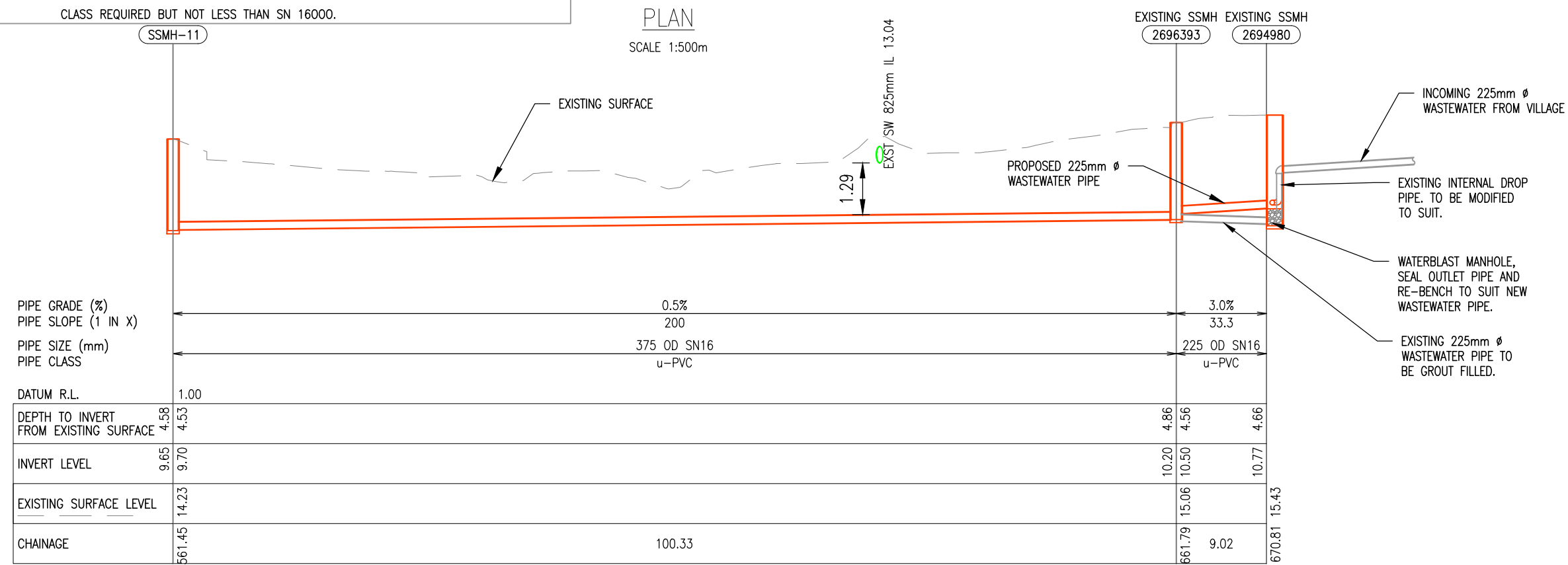
WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER GRAVITY MAIN PLAN AND LONG SECTION - SHEET 4 OF 5





**NOTES:**

- 1540MM MANHOLES TO BE IN ACCORDANCE WITH WSL STANDARD DRAWING 2000244.012.
- DN 400 GRP MAY BE USED FOR TRENCHLESS CONSTRUCTION. JOINTS TO BE 316 STAINLESS STEEL RING WITH INTERNAL RUBBER SEAL. CONTRACTOR TO NOMINATE STIFFNESS CLASS REQUIRED BUT NOT LESS THAN SN 16000.



LONG SECTION SCALE 1:500m(H), 1:250(V)

**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	PH	DATE
					J.C.	PH	12-21
					J.C.	DES. APPROVED	12-21
					J.C.	DRAWN	12-21
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.		DJ	DWG. APPROVED	12-21
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.			WSL DESIGN MGMT.	
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.			WSL PROJ. LEAD	

**Watercare**

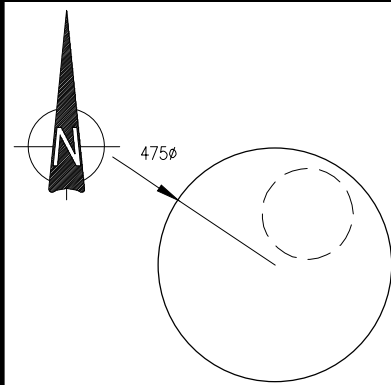
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI

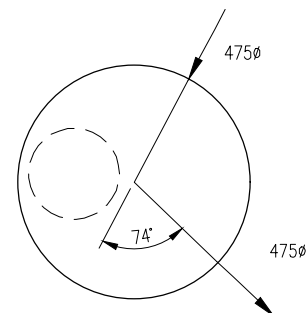


INTERIM SLAUGHTERHOUSE PS - WASTEWATER GRAVITY MAIN PLAN AND LONG SECTION - SHEET 5 OF 5

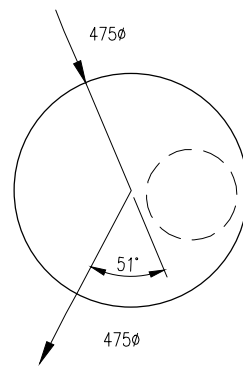
CAD FILE	R0017910.002	DATE	10-12-21
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	R0017910.009	ISSUE	3



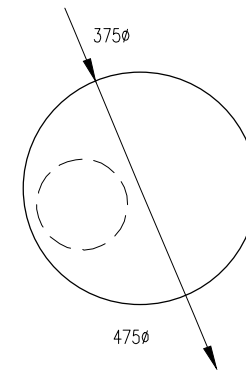
SSMH-1



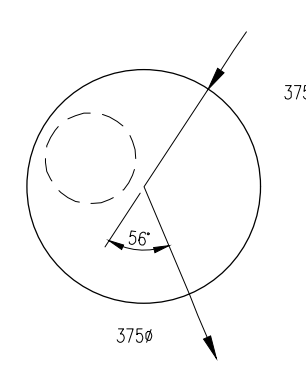
SSMH-2



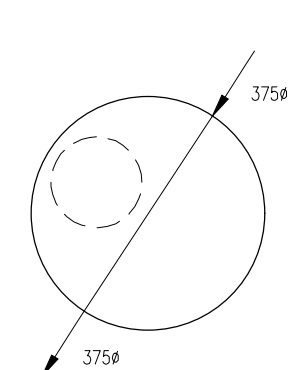
SSMH-3



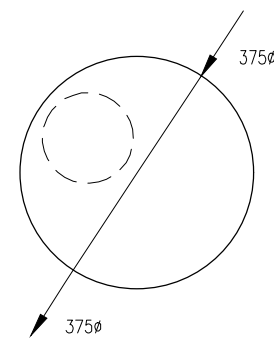
SSMH-4



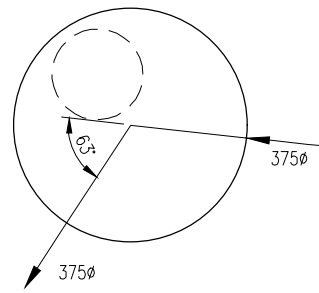
SSMH-5



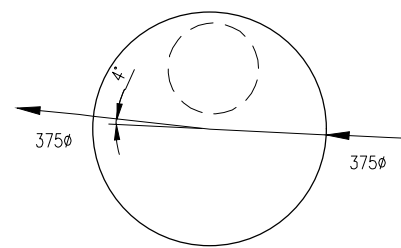
SSMH-6



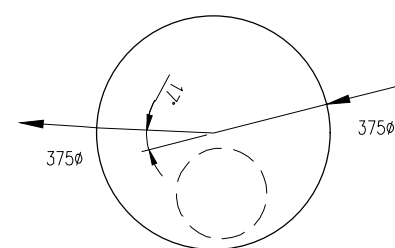
SSMH-7



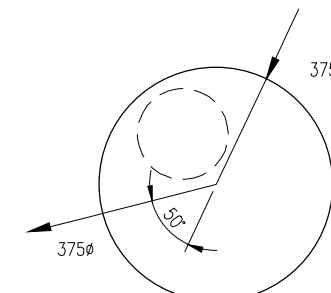
SSMH-8



SSMH-9



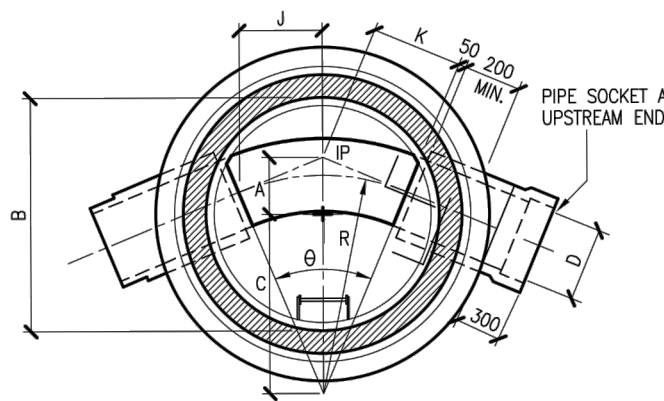
SSMH-10



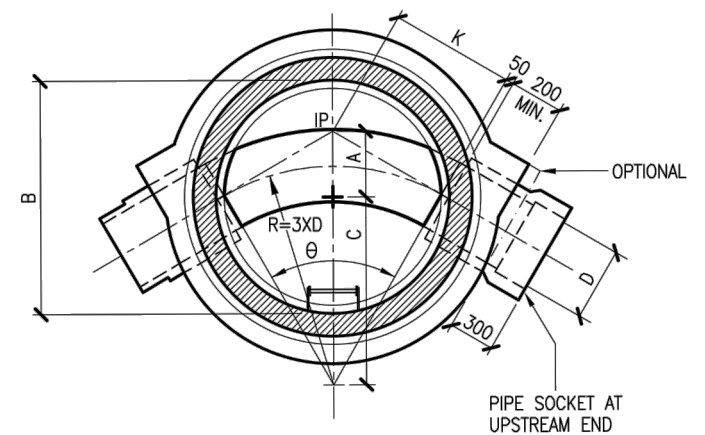
SSMH-11

SETOUT POINTS		
POINT	EASTING	NORTHING
SSMH-1	1743047.960	5926628.398
SSMH-2	1743042.764	5926631.866
SSMH-3	1743074.715	5926692.257
SSMH-4	1743064.939	5926715.540
SSMH-5	1743043.477	5926766.654
SSMH-6	1743063.052	5926796.415
SSMH-7	1743115.318	5926875.877
SSMH-8	1743158.943	5926942.204
SSMH-9	1743211.314	5926936.361
SSMH-10	1743295.217	5926932.351
SSMH-11	1743352.770	5926946.971

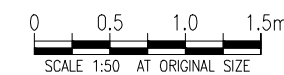
MANHOLE DIMENSION DETAIL										
MH No.	TYPE	PIPE ID	$\theta$	J	R	K	A	B	C	NOTES
SSMH-1	A1	460		616		616	201	1540		
SSMH-2	A2	460	84°	616	1380	1243	548	1540	1149	
SSMH-3	A1	460	51°	616	1431	682	385	1540	1201	
SSMH-4	A1	460	0°	616		616	201	1540		STRAIGHT
SSMH-5	A1	370	56.4°	616	1312	698	442	1540	1044	
SSMH-6	A1	370	0°	616		616	237	1540		STRAIGHT
SSMH-7	A1	370	0°	616		616	237	1540		STRAIGHT
SSMH-8	A2	370	63°	616	1110	680	473	1540	840	
SSMH-9	A1	370	4°	616	17651	616	250	1540	17411	
SSMH-10	A1	370	17°	616	4168	623	295	1540	3919	
SSMH-11	A1	370	50°	616	1458	680	417	1540	1192	



TYPE A1  
SCALE: 1:50 & N.TS.



TYPE A2  
SCALE: 1:50 & N.TS.



**DETAILED DESIGN**  
**NOT FOR CONSTRUCTION**

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	PH	DATE
2	11-21	ISSUED FOR DETAILED DESIGN	D.X.	S.W.	W.S.L. DESIGN MGMT.		12-21
1	11-21	ISSUED FOR PRELIMINARY DESIGN	D.X.	S.W.	W.S.L. PROJ. LEAD		12-21

**Watercare**  
 COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

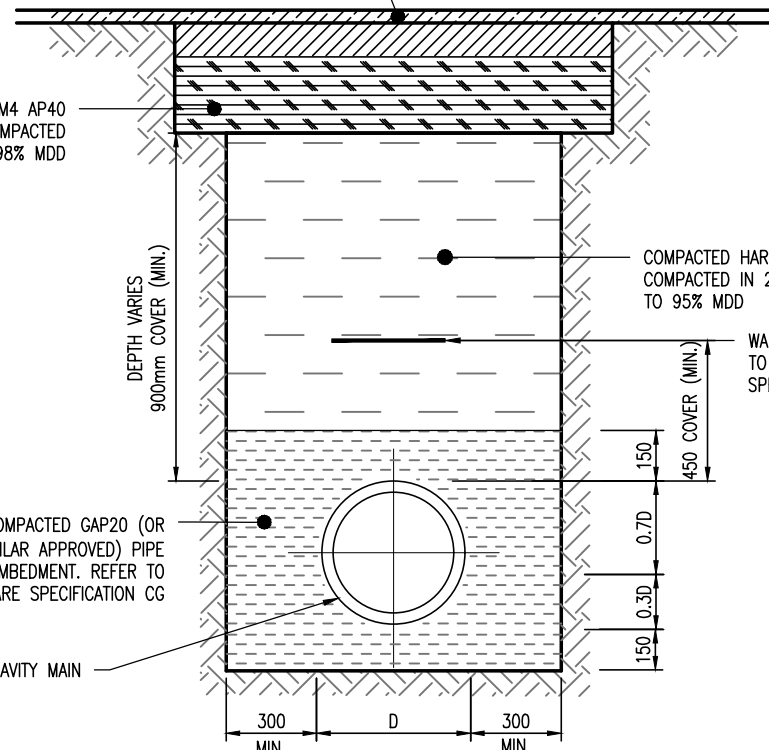
WHENUAPAI-REDHILLS WASTEWATER SERVICING  
 BRIGHAM CREEK ROAD, WHENUAPAI  
 INTERIM SLAUGHTERHOUSE PS - WATER GRAVITY MAIN MANHOLE DIMENSIONS AND SETOUT



CAD FILE	R0017910.010	DATE	10-12-21
ORIGINAL SCALE	A3 1:50	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32	DWG No.	R0017910.010
		ISSUE	2

REFER AUCKLAND TRANSPORT - CODE OF PRACTICE FOR WORKING IN THE ROAD FOR ALL BACKFILLING, REINSTATEMENT IN THE ROAD RESERVE

300 mm TNZ M4 AP40 BASECOURSE COMPACTED TO 98% MDD



PIPE TRENCH INSTALLATION IN EXISTING CARRIAGEWAY

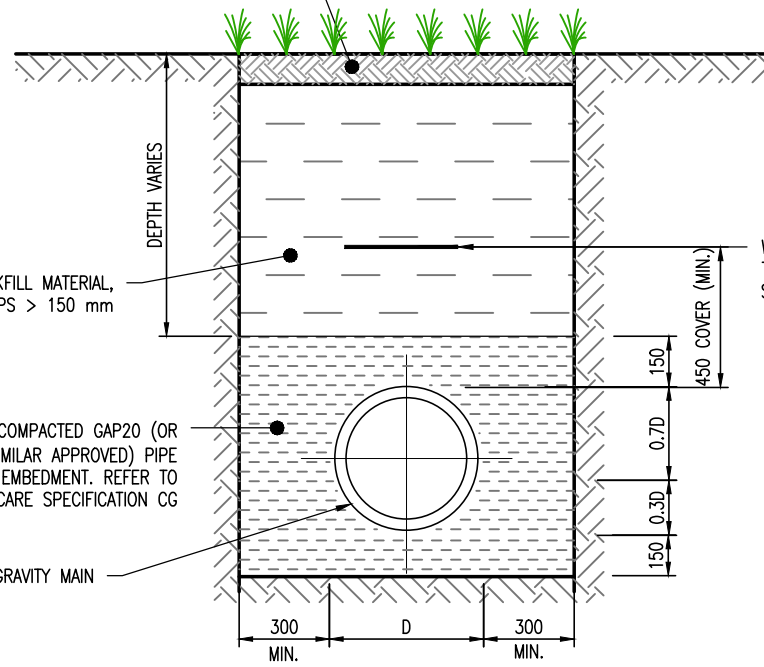
SCALE NTS

REINSTATEMENT TO MATCH EXISTING OR AS ADVISED BY THE ENGINEER

SELECTED BACKFILL MATERIAL, FREE OF LUMPS > 150 mm

COMPACTED GAP20 (OR SIMILAR APPROVED) PIPE EMBEDMENT. REFER TO WATERCARE SPECIFICATION CG

GRAVITY MAIN



PIPE INSTALLATION IN GRASS AND BERM

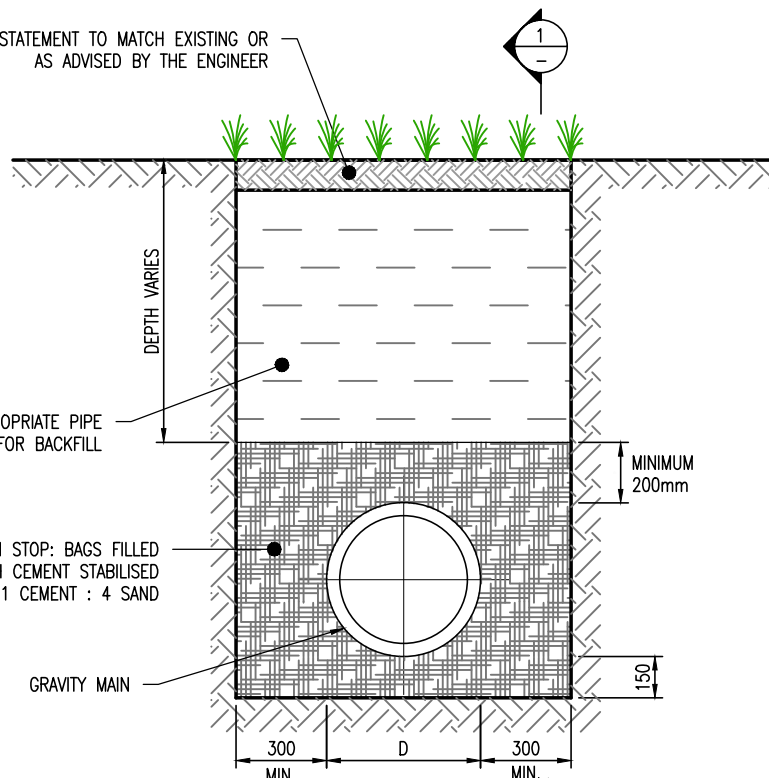
SCALE NTS

REINSTATEMENT TO MATCH EXISTING OR AS ADVISED BY THE ENGINEER

REFER TO APPROPRIATE PIPE INSTALLATION FOR BACKFILL

TRENCH STOP: BAGS FILLED WITH CEMENT STABILISED SAND. 1 CEMENT : 4 SAND

GRAVITY MAIN



TRENCH STOP

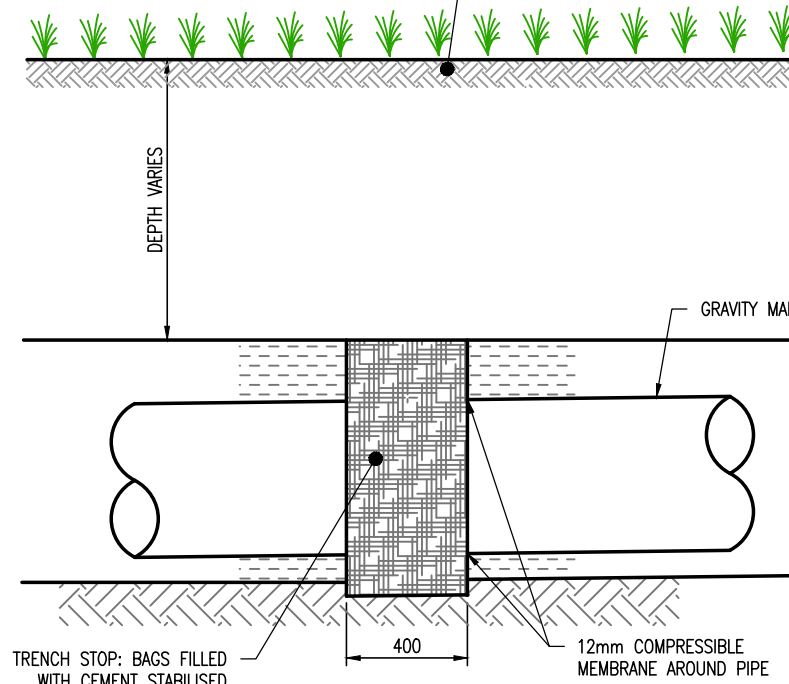
SCALE NTS

REINSTATEMENT TO MATCH EXISTING OR AS ADVISED BY THE ENGINEER

GRAVITY MAIN

TRENCH STOP: BAGS FILLED WITH CEMENT STABILISED SAND. 1 CEMENT : 4 SAND

12mm COMPRESSIBLE MEMBRANE AROUND PIPE



SECTION 1

SCALE NTS

NOTES:

1. MINIMUM HORIZONTAL AND VERTICAL CLEARANCE TO OTHER SERVICES COMPLIES WITH WATERCARE CODE OF PRACTICE.
2. FOR SELECTED BACKFILL MATERIAL REFER TO WATERCARE STANDARD.
3. DIMENSION 'D' REFERS TO THE EXTERNAL PIPE DIAMETER.

**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	PH	DATE
					D.J.	P.H.	11-21
					D.X.		12-21
3	12-21	ISSUED FOR DETAILED DESIGN	D.J.	P.H.	D.W.G. APPROVED	J.C.	12-21
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	D.X.		W.S.L. DESIGN MGMT.		12-21
1	5-21	ISSUED FOR PRELIMINARY DESIGN	D.X.		W.S.L. PROJ. LEAD		

**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI

INTERIM SLAUGHTERHOUSE PS - WASTEWATER GRAVITY MAIN TRENCH DETAILS



CAD FILE	R0017910.011	DATE	10-12-21
ORIGINAL SCALE	A3 NTS	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	R0017910.011	ISSUE	3

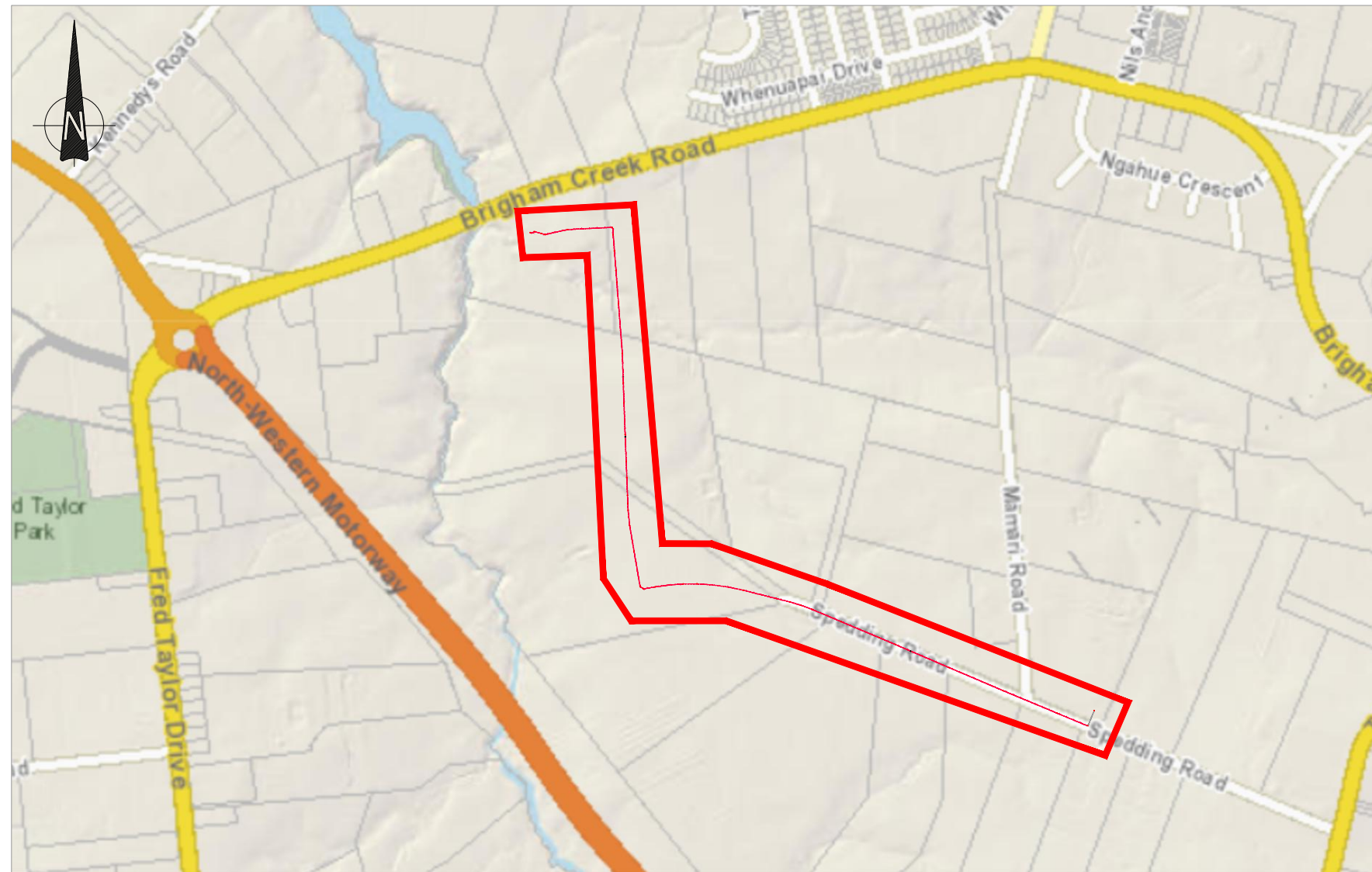
# WHENUAPAI - REDHILLS WASTEWATER SERVICING BRIGHAM CREEK ROAD, WHENUAPAI INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN

DRAWING No		DRAWING TITLE	ISSUE
2013654	001	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - DRAWING INDEX	3
2013654	002	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - LOCATION PLAN	3
2013654	003	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - GENERAL NOTES	5
2013654	004	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - GENERAL LAYOUT	5
2013654	005	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 1 OF 12	5
2013654	006	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 2 OF 12	5
2013654	007	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 3 OF 12	5
2013654	008	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 4 OF 12	5
2013654	009	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 5 OF 12	5
2013654	010	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 6 OF 12	5
2013654	011	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 7 OF 12	5
2013654	012	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 8 OF 12	5
2013654	013	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 9 OF 12	5
2013654	014	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 10 OF 12	5
2013654	015	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 11 OF 12	5
2013654	016	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 12 OF 12	4
2013654	017	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN AIR VALVE DETAILS	5
2013654	018	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN SCOUR VALVE DETAILS	5
2013654	019	INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN TRENCH DETAILS	5

**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE		DATE	AMENDMENT	BY	APPD.	DESIGNED	P. HOUGHTON	9-22	 <p><b>Watercare</b></p> <p><small>COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.</small></p>	WHENUAPAI-REDHILLS WASTEWATER SERVICING BRIGHAM CREEK ROAD, WHENUAPAI INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - DRAWING INDEX	 	CAD FILE	2013654.001	DATE	09-09-22
						DES. APPROVED	S. WANG	9-22				ORIGINAL SCALE	A3	CONTRACT No.	6484-6934
						DRAWN	S. VASOL	9-22				REF No.	12508391   3-AWD32		
						DWG. APPROVED	D. XIE	9-22				DWG No.	2013654.001	ISSUE	3

# WHENUAPAI - REDHILLS WASTEWATER SERVICING BRIGHAM CREEK ROAD, WHENUAPAI INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN



LOCALITY PLAN

**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	DES. APPROVED	DRAWN	DWG. APPROVED	WSL DESIGN MGMT.	WSL PROJ. LEAD	BY	APPD.	DATE
3	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	P. HOUGHTON	S. WANG	S. VASOL	D. XIE					9-22
2	4-22	RE-ISSUED FOR DETAILED DESIGN	D.X.	P.H.									9-22
1	12-21	ISSUED FOR DETAILED DESIGN	D.X.	P.H.									9-22

**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - LOCATION PLAN



CAD FILE	2013654.002	DATE	09-09-22
ORIGINAL SCALE	A3 N.T.S.	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.002	ISSUE	3

THE SCOPE OF EARTHWORK SPECIFICATION RELATES ONLY TO EXCAVATION/BACKFILL WITHIN OPEN TRENCH WORKS, SURROUNDING MANHOLES, AND THE BACKFILL TO ORIGINAL CONDITIONS/DESIGN REQUIRED PROFILE.

**1. SITE VERIFICATION**

THE CONTRACTOR SHALL BE DEEMED TO HAVE REVIEWED THE GEOTECHNICAL FACTUAL REPORT AND HAVE READ AND UNDERSTOOD THE INFERRED GROUND CONDITIONS.

**2. SITE MANAGEMENT PLAN**

THE CONTRACTOR SHALL PREPARE AN EARTHWORKS MANAGEMENT PLAN PRIOR TO THE COMMENCEMENT OF WORKS AND INCLUDING EROSION AND SEDIMENT CONTROL AND DUST CONTROL. THE MANAGEMENT PLAN SHOULD MAKE REFERENCE TO LOCAL AUTHORITY REQUIREMENTS. THIS PLAN SHALL BE SUBMITTED TO THE LOCAL AUTHORITY AND APPROVED PRIOR TO COMMENCING ANY EARTHWORKS.

**3. PRIOR TO COMMENCEMENT OF CONSTRUCTION**

EXISTING SERVICES

BEFORE COMMENCEMENT OF EXCAVATION, THE CONTRACTOR SHALL ASCERTAIN THE LOCATION OF THE EXISTING SERVICES WITHIN THE WORK AREAS OR AREAS LIKELY TO BE AFFECTED BY THE WORK AND DRAINAGE FOR THEIR CONNECTION AND DIVERSION.

INSTRUCTIONS OR INFORMATION GIVEN TO THE CONTRACTOR BY THE ENGINEER OR SHOWN ON THE DRAWINGS, SHALL IN NO WAY RELEASE HIM FROM LIABILITIES UNDER THIS CLAUSE.

WHEN TRENCHING AND EXCAVATING, CARE IS TO BE TAKEN NOT TO DAMAGE EXISTING DRAINS, WATER MAINS, CABLES, ETC. IF IN SERVICE. SHOULD ANY DAMAGE OCCUR, THE ENGINEER AND LOCAL AUTHORITY SHALL BE NOTIFIED AT ONCE AND THE DAMAGE MADE GOOD.

SURFACE DRAINAGE

TEMPORARY SURFACE DRAINAGE SHALL BE CONSTRUCTED BY THE CONTRACTOR TO MAINTAIN THE NATURAL DRAINAGE AND LIMIT THE INTRODUCTION OF WATER TO THE EARTHWORKS.

**4. FILL MATERIAL DEFINITION**

GRANULAR FILL

DEFINED AS A WELL GRADED, DURABLE, GRANULAR AGGREGATE WHICH CONTAINS SPECIFIED FINES AND WHICH MEETS SPECIFIED GRADING, STRENGTH, AND DURABILITY CRITERIA AS DEFINED BELOW:

- GRADINGS FOR GAP65, GAP40 AND GAP20 ARE TO CONFORM TO THOSE SPECIFIED IN THE SUMMARY TABLE1
- FREE DRAINING GRANULAR MATERIAL SHALL BE IMPORTED CRUSHED AND GRADED CLEAN MATERIAL, PREFERABLY, WELL GRADED OR UNIFORM, WITH 100% PASSING A 10MM SIEVE, AND 15% PASSING A 0.5MM SIEVE OR OTHER SIMILAR APPROVED.
- IF THE MATERIAL AND GRADING IS NOT SPECIFIED ELSEWHERE, HARDFILL MATERIAL SHALL BE GAP65 MATERIAL OR FILL APPROVED BY THE ENGINEER.

THE CONTRACTOR IS TO SUPPLY THE FOLLOWING DATA RELATED TO THE PROPOSED BACKFILL MATERIALS FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION:

- ADDRESS OF THE SOURCE QUARRY;
- THE GEOLOGICAL DESCRIPTION OF THE PARENT MATERIAL;
- THE CONTRACTOR SHALL PROVIDE A PARTICLE SIZE DISTRIBUTION TEST, COMPACTION TEST AND BROKEN FACE PERCENTAGE TEST RESULTS FROM A REPRESENTATIVE GRAVEL FILL SAMPLE TESTED IN AN INDEPENDENT AND ACCREDITED LABORATORY.
- RESULTS OF COMPACTION TESTS AS SPECIFIED IN NZS 4402:1988 – TEST 4.1.1 OR TEST 4.1.3 ARE TO BE CARRIED OUT ON THE PROPOSED BACKFILL AND THE RESULTS PRESENTED TO THE ENGINEER FOR AGREEMENT PRIOR TO CONSTRUCTION. THESE ARE TO CLEARLY SHOW THE OPTIMUM MOISTURE CONTENT AND MAXIMUM DENSITY ACHIEVED.

BASED ON THE ABOVE DETAILS, THE CONTRACTOR IS TO AGREE THE METHOD OF COMPACTION WITH THE DESIGNER PRIOR TO COMMENCEMENT OF CONSTRUCTION ON SITE.

COHESIVE FILL

DEFINED AS MATERIAL COMPRISED PREDOMINANTLY CLAY AND SILT WITH NON-GRANULAR COMPOSITE.

CLEAN FILL

CLEANFILL MATERIAL IS MATERIAL THAT DOES NOT UNDERGO ANY PHYSICAL, CHEMICAL, OR BIOLOGICAL TRANSFORMATIONS THAT WILL CAUSE ADVERSE ENVIRONMENTAL EFFECTS OR HEALTH EFFECTS ONCE IT IS PLACED IN THE GROUND. CLEANFILL MATERIAL HAS NO POTENTIALLY HAZARDOUS CONTENT AND MUST NOT BE CONTAMINATED BY OR MIXED WITH ANY OTHER NON-CLEANFILL MATERIAL.

UNSUITABLE

DEFINED AS MATERIAL NOT CONSIDERED ACCEPTABLE FOR THE USE AS ENGINEERING FILL WITHIN THE BACKFILL OF THE TRENCH EXCAVATIONS AND/OR ACCESS PLATFORM. THIS WILL COMPRISE:

- o OVERLY ORGANIC / ORGANIC MATERIAL / TOPSOIL
- o NON-ENGINEERED FILL THAT CANNOT BE RECONDITIONED
- o OVERLY SATURATED MATERIAL THAT CANNOT BE RECONDITIONED
- o REFUGE/RUBBISH

SITE WON MATERIAL

MATERIAL THAT IS IN-SITU, AND EXCAVATED FOR CONTRACT WORKS. THIS MATERIAL CAN BE CONDITIONED (DRIED, DISCED

AND BLENDED) AND BE PLACED AS PART OF SITE EARTHWORK TO MEET COMPACTION REQUIREMENTS.

ACCEPTABLE MATERIAL

ACCEPTABLE FILL IS TO BE USED FOR EARTHWORKS WHICH COMPRISES THE FOLLOWING MATERIALS LISTED BELOW FOR VARIOUS AREAS. IN ADDITION, MINIMUM STRENGTHS ALSO REQUIRED TO BE ACHIEVED, AS DEFINED IN SECTIONS 8 & 9 OF THIS SPECIFICATION.

- a) TRENCH BACKFILL
  - o CLEAN FILL (COHESIVE), WON 100% FROM SITE AND REUSED/RECONDITIONED
  - o IMPORTED FILL (COHESIVE), 100% OFFSITE, AND USED
  - o MIXED/CONDITIONED FILL (COHESIVE), COMPRISING BOTH LOCALLY WON AND IMPORTED (SECTION 7 FOR CONDITIONING NOTES).
- b) MANHOLES
  - o CLEAN IMPORTED GRANULAR FILL, GAP65 OR EQUIVALENT (FOR BULK BACKFILLING OF MANHOLE TRENCH EXCAVATIONS ONLY) OR SAND

**5. EXCAVATION – PIPE TRENCH AND MANHOLE**

GENERAL REQUIREMENTS

- a) THE BOTTOM OF THE EXCAVATIONS SHALL BE FORMED ON SUITABLE NATURAL MATERIAL AS AGREED BY THE CONTRACTOR AND ENGINEER, AND BE SUITABLY SHORED IF NEEDED TO ALLOW HORIZONTAL PLACEMENT OF FILL. THE ENGINEER MAY REQUIRE ADDITIONAL EXCAVATION TO REMOVE ANY POCKETS OF SOFT SOIL, UNSUITABLE MATERIAL, OR LOOSE ROCK.
- b) TRENCH EXCAVATION SHOULD BE STAGED. MAXIMUM EXCAVATION OF TRENCH EXCAVATION SHOULD BE NO MORE THAN 10 M IN LENGTH EACH STAGE.
- c) EXCAVATION FOR THE PARTICULAR SECTION OF OPEN TRENCH WORK SHALL NOT COMMENCE UNTIL THE CORRESPONDING ADJACENT SECTION OF IN-GROUND RETAINING WALL HAS BEEN CONSTRUCTED AND A MINIMUM OF 7 DAYS HAS LAPSED SINCE THE CONCRETE HAS BEEN POURED
- d) THE EXCAVATIONS SHALL BE KEPT FREE OF WATER.
- e) NO WORK SHALL BE CARRIED OUT UPON PREPARED EXCAVATION SURFACES UNTIL THE ENGINEER HAS APPROVED THE PREPARED SURFACES.
- f) TEMPORARY AND PERMANENT CUT SLOPES SHALL BE ADEQUATELY PROTECTED.
- g) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EFFECT OR DAMAGE THE TEMPORARY WORKS MAY HAVE UPON OR WHICH MAY BE CAUSED TO THE WORKS, ANY EXISTING STRUCTURES OR ANY SURROUNDING PROPERTY AND FOR ANY EFFECT OR DAMAGE THAT MAY BE CAUSED BY THE EXCAVATION OR DISPOSAL OF EXCAVATED MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LANDSLIPS IN THE EXCAVATION AND ANY INJURIOUS EFFECTS CAUSED THEREBY AND SHALL MAKE GOOD ALL SUCH DAMAGE WHETHER TO THE WORKS, THE ADJOINING PROPERTY OR ADJACENT STRUCTURES TO THE SATISFACTION OF THE ENGINEER AND / OR LOCAL REGULATORY AUTHORITY.
- h) THE CONTRACTOR SHALL EMPLOY ONLY THOSE PLANT AND WORKING METHODS WHICH ARE SUITED TO THE MATERIALS TO BE HANDLED AND TRAVERSED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE NATURE OF THE SUITABLE MATERIAL SO THAT WHEN IT IS PLACED AND COMPACTED IT REMAINS ACCEPTABLE.

EXCAVATION IN SOIL, NON ENGINEERED FILL AND ROCK

THE CONTRACTOR SHALL ACCOUNT FOR ALL MATERIALS ENCOUNTERED, THAT COULD REASONABLY BE ANTICIPATED FROM THE GEOTECHNICAL INFORMATION PROVIDED. THIS SHALL INCLUDE VARIABLE MATERIAL IN THE NON-ENGINEERED FILL.

EXCAVATION SUPPORT

THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT WHERE NECESSARY. AS A MINIMUM, IT IS EXPECTED THAT ANY PROPOSED TRENCH IS PROTECTED BY TRENCH SHIELDS DURING EXCAVATION AND ALL PROPOSED MANHOLE / LAUNCH-RETRIEVAL SHAFTS BE SUPPORTED BE ADEQUATE STEEL RING CAISSONS. .

ALTERNATIVE SUPPORT MAY BE PROVIDED BY THE CONTRACTORS ENGINEER, SUBJECT TO PRIOR APPROVAL / VERIFICATION FROM THE DESIGN ENGINEER.

**6. FILL CONDITIONING**

FOR COHESIVE FILL, IN THE EVENT THAT SITE WON MATERIAL OR IMPORTED MATERIAL IS OVERLY SATURATED, REQUIRES BLENDING, OR DOES NOT DISPLAY SUFFICIENT PLASTICITY FOR ACHIEVING PROPER COMPACTION, THE CONTRACTOR MAY CONSIDER CONDITIONING OF THE MATERIAL PRIOR TO PLACEMENT AS ACCEPTABLE FILL. CONDITIONING INCLUDING SPECIFIC METHODOLOGIES SHOULD BE DISCUSSED AND AGREED BY THE CONTRACTOR AND THE DESIGNER AS REQUIRED, AT THE TIME.

**7. PLACEMENT AND COMPACTION OF FILL – TRENCH AND MANHOLE EXCAVATION**

- a. THE GENERAL PRINCIPLE TO BE ACHIEVED IN BACKFILLING OF THE TRENCH IS TO MAINTAIN AS BEST AS PRACTICAL THE ORIGINAL PERMEABILITY OF THE SOILS BELOW THE SLOPE. APPROVED LOCALLY WON MATERIAL, IMPORTED OR BLENDED MATERIAL MAY BE USED.
- b. PIPE BEDDING REQUIREMENTS SHOULD BE FOLLOWED AS PER PIPE DESIGN AND AS SPECIFIED ON DRAWING 2013654.017.

FOR TRENCH BACKFILL WORKS:

- a) MATERIAL TO COMPRISE COHESIVE, PREFERABLY LOCALLY WON, IMPORTED OR BLENDED (AT THE DIGRESSION OF THE DESIGN ENGINEER).
- b) RECONDITIONING OF LOCALLY WON MATERIAL OK, PROVIDED SITE PLATEAU TESTING AND/OR LABORATORY TESTING OF SAMPLE CAN BE PERFORMED AND PROVIDED BY CONTRACTOR
- c) PLACEMENT OF FILL IN LOOSE LAYERS NOT EXCEEDING 200 MM

- d) COMPACTION VIA THE USE OF MACHINE PLANT, SUFFICIENTLY WEIGHTED AND WITH A STUDDED SURFACE, I.E. A PAD-FOOT OR EQUIVALENT. FLAT PLATES NOT TO BE USED.
- e) CARE TO BE TAKEN DURING THE FIRST 1-2 LIFTS ABOVE THE PIPE BEDDING MATERIAL TO AVOID DAMAGE TO THE UNDERLYING PIPE
- f) COMPACTION OF THE TRENCH BACKFILL SHOULD ACHIEVE THE MINIMUM STRENGTH VALUES (TO BE VERIFIED ON SITE): COMPACTION REQUIREMENTS AS SET OUT BELOW:
  - o 5% AIR VOIDS
  - o TESTING AT NOMINAL LOCATIONS ALONG TRENCH, AND MINIMUM ONE TEST APPROXIMATELY HALF WAY UP, AND ONE AT FINISH LEVEL.

FOR MANHOLE BACKFILL:

- a) USE OF APPROPRIATELY SIZED GRANULAR FILL ACCEPTABLE
- b) TO BE COMPACTED IN LOOSE LAYERS NOT EXCEED TWICE THE AVERAGE PARTICLE DIAMETER
- c) USE OF VIBRATION COMPACTING EQUIPMENT
- d) ALTERNATIVELY THE USE OF SAND BACKFILL MAY BE CONSIDERED, IF COMPACTION OF GRANULAR FILL DEEMED IMPRACTICAL WITH THE SITE CONSTRAINTS

**8. COMPACTION TESTING**

COMPACTION REQUIREMENTS

ONE "SET" OF NUCLEAR DENSOMETER TESTS (WHERE ONE "SET" = 3 INDIVIDUAL TESTS) IS TO BE CARRIED OUT FOR EACH 30M<sup>2</sup> OF FILL PLACED. 95% OF THE TESTS CARRIED OUT MUST MEET THE REQUIRED DENSITY SPECIFICATION."

WHERE FIELD TESTS INDICATE THAT THE SPECIFIED STANDARD OF COMPACTION HAS NOT BEEN ACHIEVED, CORRECTIVE ACTION SHALL BE TAKEN TO BRING THE FILL TO THE REQUIRED STANDARD AND AS REQUIRED BY THE ENGINEER. THIS MAY REQUIRE EXCAVATION AND REMOVAL OF THE FAILED FILL.

COMPACTION STANDARDS

AT ANY TIME EITHER PRIOR TO OR DURING THE COURSE OF CONSTRUCTION, THE ENGINEER MAY DIRECT MODIFICATIONS TO THE FOLLOWING COMPACTION CRITERIA, WITH THE OBJECT OF ENSURING THAT THE COMPACTION CRITERIA FOR THE PARTICULAR MATERIALS AND CONDITIONS BEING ENCOUNTERED OR LIKELY TO BE ENCOUNTERED ARE ACHIEVED.

**9. FILL CONTROL AND TEST METHODS**

GENERAL

NUCLEAR DENSOMETER TESTS WILL BE USED TO DETERMINE THE CLASSIFICATION AND COMPACTION STANDARDS OF FILL MATERIALS. APPROXIMATE TEST METHODS, SUCH AS A HAND SHEAR VANE, MAY BE EMPLOYED TO OBTAIN RAPID INDICATIVE RESULTS, BUT APPROXIMATE METHODS SHALL NOT BE USED FOR ACCEPTANCE PURPOSES WHERE THE ADEQUACY OF MATERIALS, PROCESSING OR WORKMANSHIP IS IN DOUBT OR THE AMOUNT BY WHICH THE TEST RESULT FAILS WITHIN THE CONFIDENCE LIMITS OF THE APPROXIMATE TEST RESULT. NUCLEAR DENSOMETER SHOULD BE COMPLETED IN ACCORDANCE WITH TEST METHOD NZS4407 TEST 4.2.1 AND BE CALIBRATED IN ACCORDANCE WITH TEST 4.2.4 OF NZS4407: 1991 AT A FREQUENCY NOT EXCEEDING 2 YEARS IN AN IANZ ACCREDITED LABORATORY.

PRIOR TO PLACEMENT OF FILL, CONTRACTOR IS TO OBTAIN A SITE SPECIFIC BULK HEAVY COMPACTION TEST FOR EACH REPRESENTATIVE FILL MATERIAL PROPOSED TO BE USED. A MINIMUM OF 1 TEST PER MATERIAL IS REQUIRED. THE TESTING SHALL BE CARRIED OUT BY A IANZ VERIFIED LABORATORY. THE RESULTS SHALL BE PROVIDED TO THE DESIGN ENGINEER FOR REVIEW PRIOR TO COMPACTION COMMENCING.

GAP 65	PERCENTAGE PASSING		GAP40	PERCENTAGE PASSING		GAP20	PERCENTAGE PASSING	
	LOWER LIMIT	UPPER LIMIT		LOWER LIMIT	UPPER LIMIT		LOWER LIMIT	UPPER LIMIT
APERTURE SIZE(MM)			APERTURE SIZE(MM)			APERTURE SIZE(MM)		
65	100	100	37.5	100	100	19	100	100
37.5	80	90	19	61	80	13.2	80	95
19	50	70	9.5	38	57	9.5	64	76
9.5	30	55	4.75	23	43	4.75	37	48
4.75	20	40	2.36	10	33	2.36	26	36
2.36	15	30	1.18	7	25	1.18	18	28
1.18	10	22	0.6	2	19	0.6	12	22
0.6	6	18	0.3	0	14	0.3	6	14
0.3	4	14	0.15	0	10	0.15	2	7
0.15	2	10	0.075	0	7	0.075	0	3
0.075	0	7						

**DETAILED DESIGN  
NOT FOR CONSTRUCTION**

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	P. HOUGHTON	9-22
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	S. WANG	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. VASOL	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	D. XIE	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.		
1	5-21	ISSUED FOR PRELIMINARY DESIGN	D.X.	P.H.	WSL PROJ. LEAD		

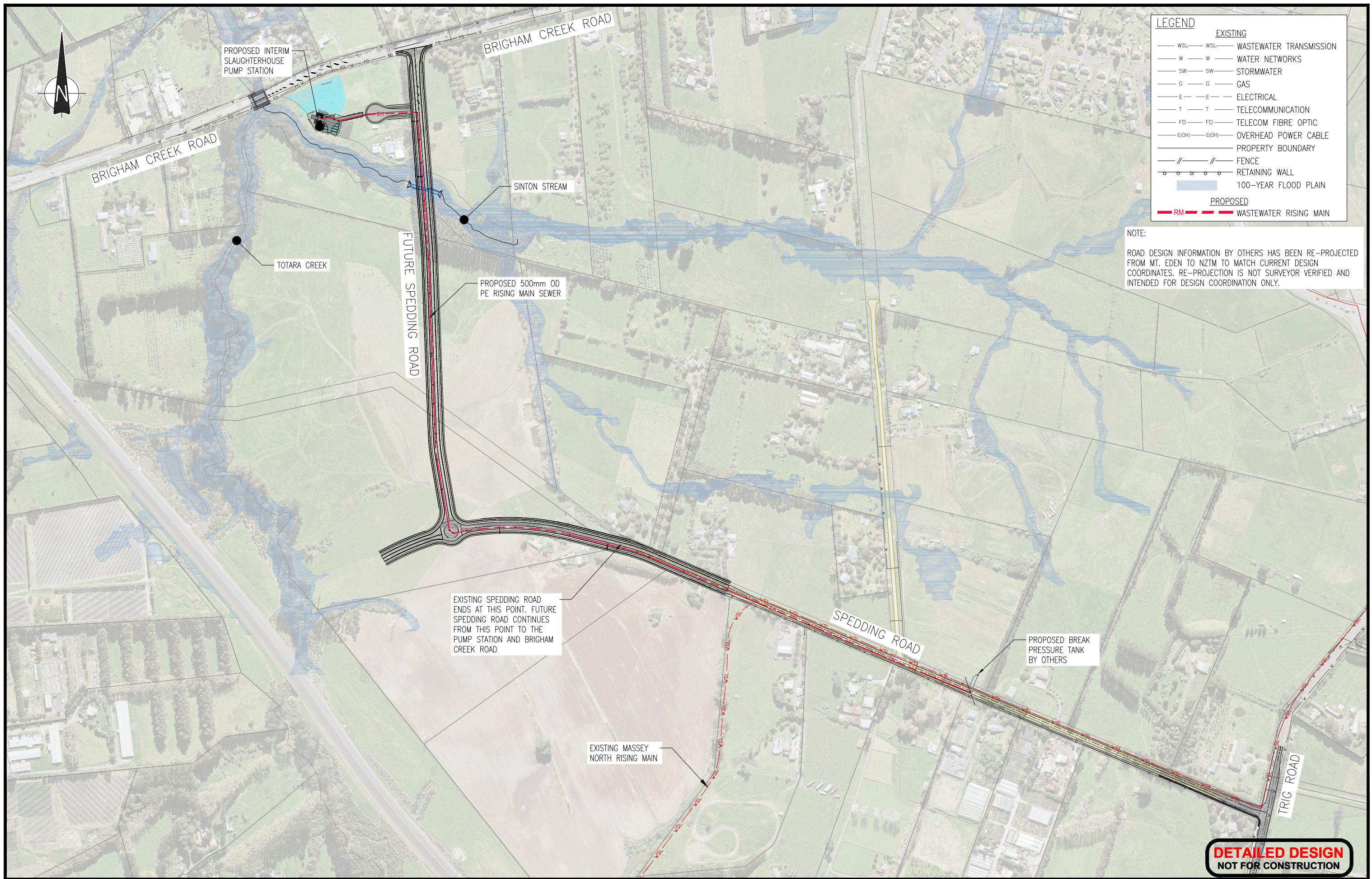


COPYRIGHT – This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS – WASTEWATER RISING MAIN – GENERAL NOTES



CAD FILE	2013654.003	DATE	09-09-22
ORIGINAL SCALE	A3 NTS	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.003	ISSUE	5



LEGEND	
<b>EXISTING</b>	
— WSL —	WASTEWATER TRANSMISSION
— W —	WATER NETWORKS
— SW —	STORMWATER
— G —	GAS
— E —	ELECTRICAL
— T —	TELECOMMUNICATION
— FO —	TELECOM FIBRE OPTIC
— E(OH) —	OVERHEAD POWER CABLE
— — —	PROPERTY BOUNDARY
— // —	FENCE
— ○ —	RETAINING WALL
— (Blue Area) —	100-YEAR FLOOD PLAIN
<b>PROPOSED</b>	
— RM —	WASTEWATER RISING MAIN

NOTE:  
ROAD DESIGN INFORMATION BY OTHERS HAS BEEN RE-PROJECTED FROM MT. EDEN TO NZTM TO MATCH CURRENT DESIGN COORDINATES. RE-PROJECTION IS NOT SURVEYOR VERIFIED AND INTENDED FOR DESIGN COORDINATION ONLY.

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	BY	DATE
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	S. WANG	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. VASOL	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	D. XIE	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.		
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL PROJ. LEAD		

**Watercare**  
 COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
 BRIGHAM CREEK ROAD, WHENUAPAI  
 INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN - GENERAL LAYOUT



CAD FILE	2013654.004-016	DATE	09-09-22
ORIGINAL SCALE	A3 1:5000	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32	DWG No.	2013654.004
		ISSUE	5

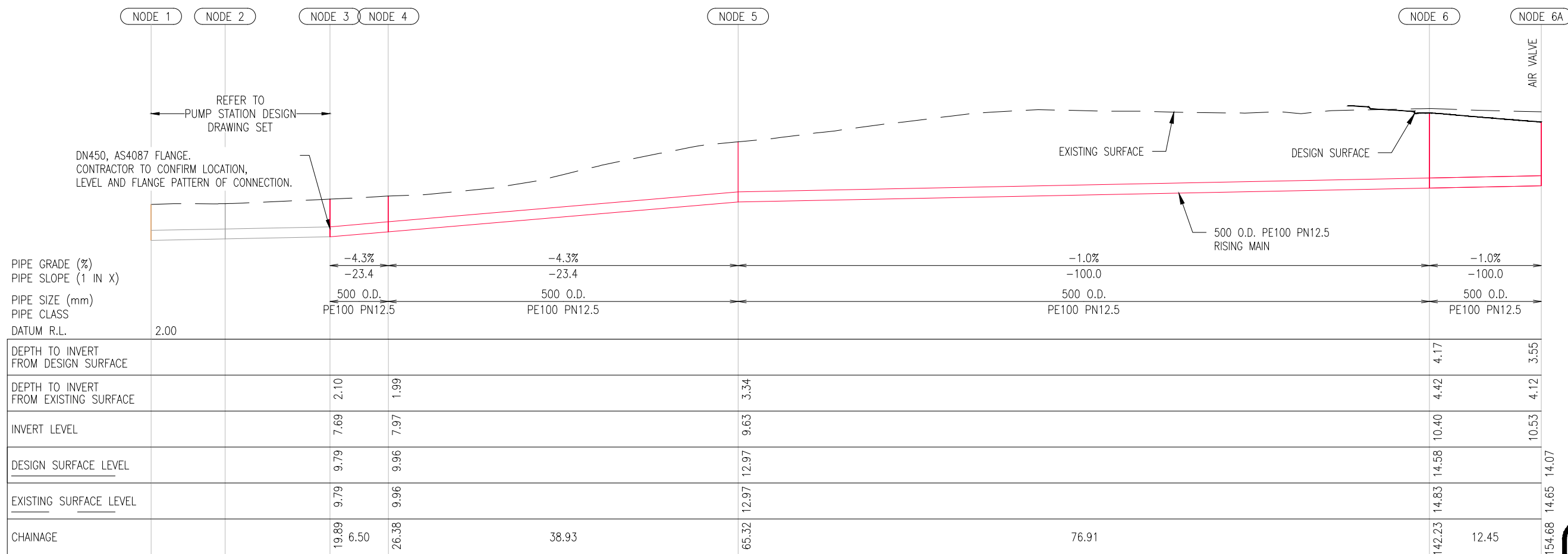
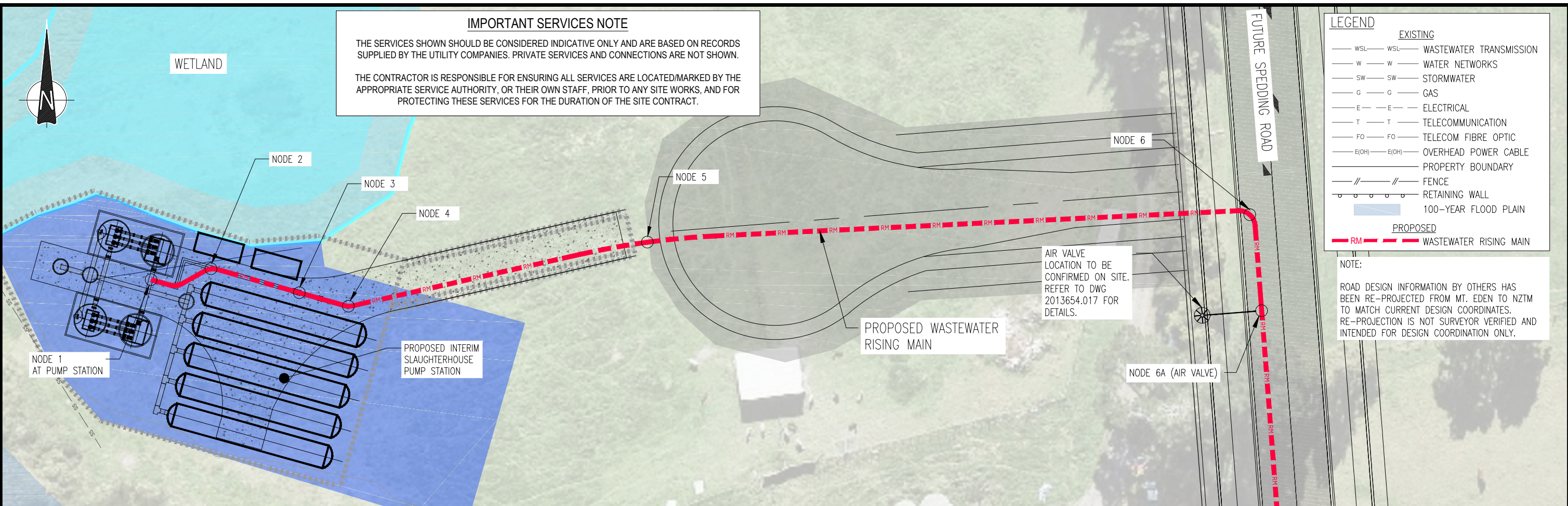
**IMPORTANT SERVICES NOTE**

THE SERVICES SHOWN SHOULD BE CONSIDERED INDICATIVE ONLY AND ARE BASED ON RECORDS SUPPLIED BY THE UTILITY COMPANIES. PRIVATE SERVICES AND CONNECTIONS ARE NOT SHOWN.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL SERVICES ARE LOCATED/MARKED BY THE APPROPRIATE SERVICE AUTHORITY, OR THEIR OWN STAFF, PRIOR TO ANY SITE WORKS, AND FOR PROTECTING THESE SERVICES FOR THE DURATION OF THE SITE CONTRACT.

EXISTING		
WSL	WSL	WASTEWATER TRANSMISSION
W	W	WATER NETWORKS
SW	SW	STORMWATER
G	G	GAS
E	E	ELECTRICAL
T	T	TELECOMMUNICATION
FO	FO	TELECOM FIBRE OPTIC
E(OH)	E(OH)	OVERHEAD POWER CABLE
---	---	PROPERTY BOUNDARY
		FENCE
---	---	RETAINING WALL
---	---	100-YEAR FLOOD PLAIN
PROPOSED		
RM	RM	WASTEWATER RISING MAIN

**NOTE:**  
ROAD DESIGN INFORMATION BY OTHERS HAS BEEN RE-PROJECTED FROM MT. EDEN TO NZTM TO MATCH CURRENT DESIGN COORDINATES. RE-PROJECTION IS NOT SURVEYOR VERIFIED AND INTENDED FOR DESIGN COORDINATION ONLY.



**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	P. HOUGHTON	9-22
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	S. WANG	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. VASOL	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	D. XIE	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.		
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL PROJ. LEAD		

**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 1 OF 12



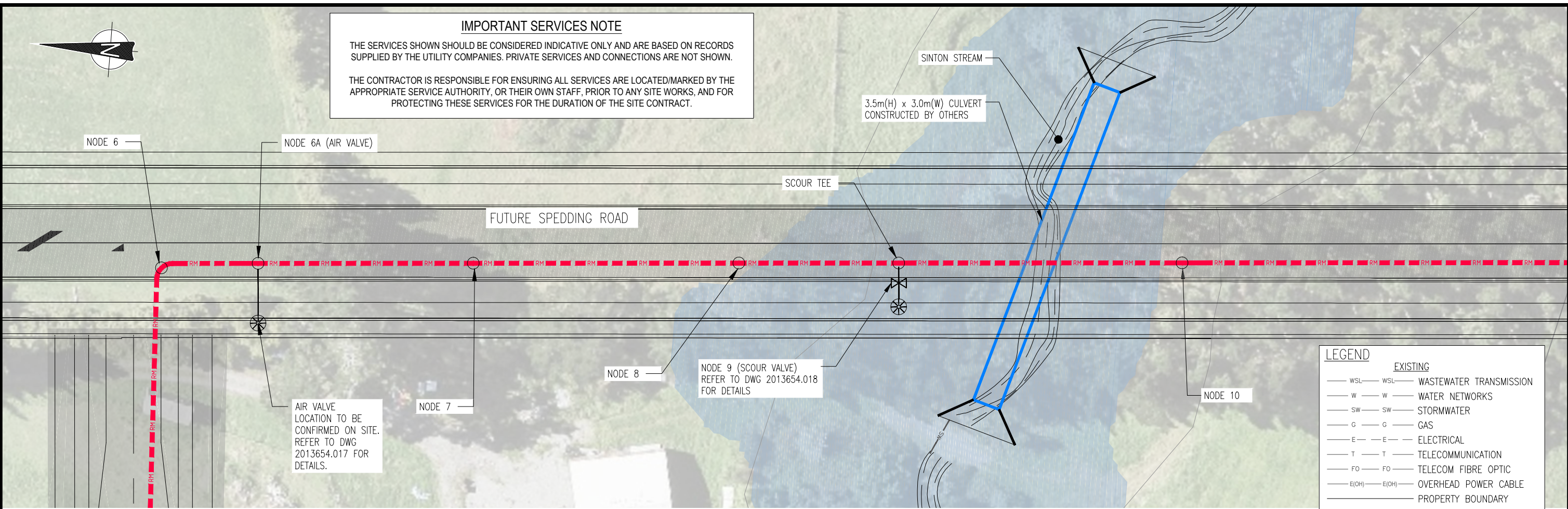
CAD FILE	2013654.004-016	DATE	09-09-22
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.005	ISSUE	5



**IMPORTANT SERVICES NOTE**

THE SERVICES SHOWN SHOULD BE CONSIDERED INDICATIVE ONLY AND ARE BASED ON RECORDS SUPPLIED BY THE UTILITY COMPANIES. PRIVATE SERVICES AND CONNECTIONS ARE NOT SHOWN.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL SERVICES ARE LOCATED/MARKED BY THE APPROPRIATE SERVICE AUTHORITY, OR THEIR OWN STAFF, PRIOR TO ANY SITE WORKS, AND FOR PROTECTING THESE SERVICES FOR THE DURATION OF THE SITE CONTRACT.

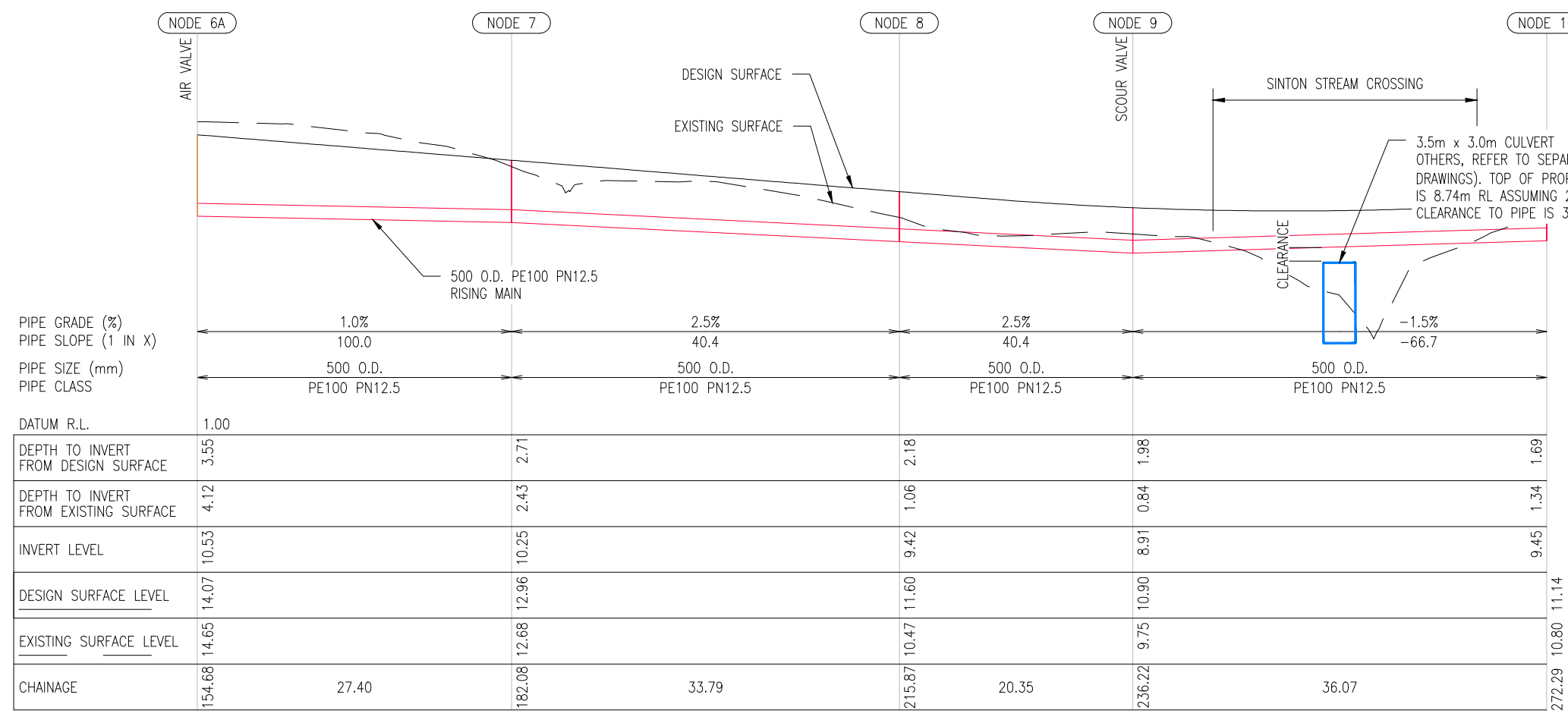


**LEGEND**

EXISTING			PROPOSED	
— WSL —	WSL —	WASTEWATER TRANSMISSION	— RM —	WASTEWATER RISING MAIN
— W —	W —	WATER NETWORKS		
— SW —	SW —	STORMWATER		
— G —	G —	GAS		
— E —	E —	ELECTRICAL		
— T —	T —	TELECOMMUNICATION		
— FO —	FO —	TELECOM FIBRE OPTIC		
— E(OH) —	E(OH) —	OVERHEAD POWER CABLE		
—	—	PROPERTY BOUNDARY		
— // —	// —	FENCE		
— [ ] —	[ ] —	RETAINING WALL		
		100-YEAR FLOOD PLAIN		

**NOTE:**

ROAD DESIGN INFORMATION BY OTHERS HAS BEEN RE-PROJECTED FROM MT. EDEN TO NZTM TO MATCH CURRENT DESIGN COORDINATES. RE-PROJECTION IS NOT SURVEYOR VERIFIED AND INTENDED FOR DESIGN COORDINATION ONLY.



**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	BY	DATE
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	P. HOUGHTON	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. WANG	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	S. VASOL	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.	D. XIE	9-22
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL PROJ. LEAD		

**Watercare**

COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 2 OF 12

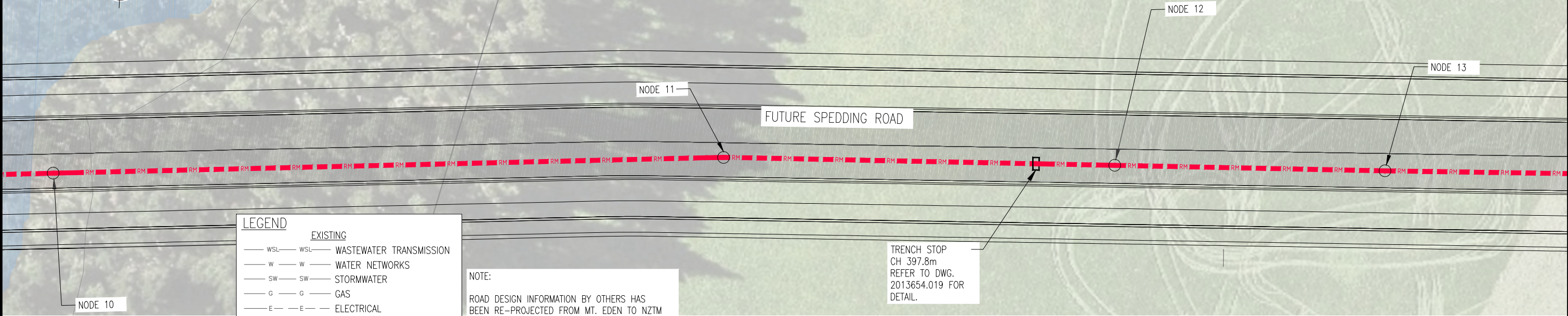


CAD FILE	2013654.004-016	DATE	09-09-22
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.006	ISSUE	5

**IMPORTANT SERVICES NOTE**

THE SERVICES SHOWN SHOULD BE CONSIDERED INDICATIVE ONLY AND ARE BASED ON RECORDS SUPPLIED BY THE UTILITY COMPANIES. PRIVATE SERVICES AND CONNECTIONS ARE NOT SHOWN.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL SERVICES ARE LOCATED/MARKED BY THE APPROPRIATE SERVICE AUTHORITY, OR THEIR OWN STAFF, PRIOR TO ANY SITE WORKS, AND FOR PROTECTING THESE SERVICES FOR THE DURATION OF THE SITE CONTRACT.

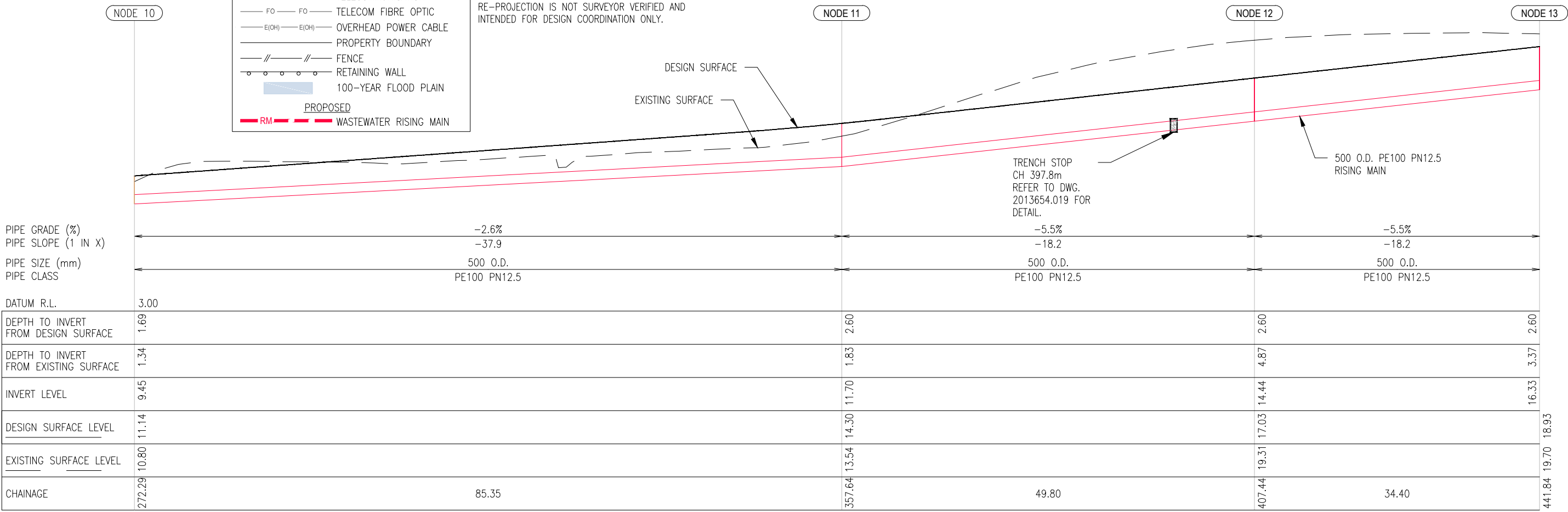


**LEGEND**

EXISTING	
— WSL —	WASTEWATER TRANSMISSION
— W —	WATER NETWORKS
— SW —	STORMWATER
— G —	GAS
— E —	ELECTRICAL
— T —	TELECOMMUNICATION
— FO —	TELECOM FIBRE OPTIC
— E(OH) —	OVERHEAD POWER CABLE
— — —	PROPERTY BOUNDARY
— // —	FENCE
— ○ —	RETAINING WALL
— — —	100-YEAR FLOOD PLAIN
PROPOSED	
— RM —	WASTEWATER RISING MAIN

**NOTE:**  
ROAD DESIGN INFORMATION BY OTHERS HAS BEEN RE-PROJECTED FROM MT. EDEN TO NZTM TO MATCH CURRENT DESIGN COORDINATES. RE-PROJECTION IS NOT SURVEYOR VERIFIED AND INTENDED FOR DESIGN COORDINATION ONLY.

TRENCH STOP  
CH 397.8m  
REFER TO DWG.  
2013654.019 FOR  
DETAIL.



**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

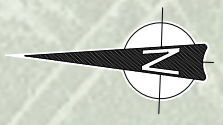
ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	BY	DATE
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	S. WANG	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. VASOL	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	D. XIE	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.		
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL PROJ. LEAD		

**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 3 OF 12



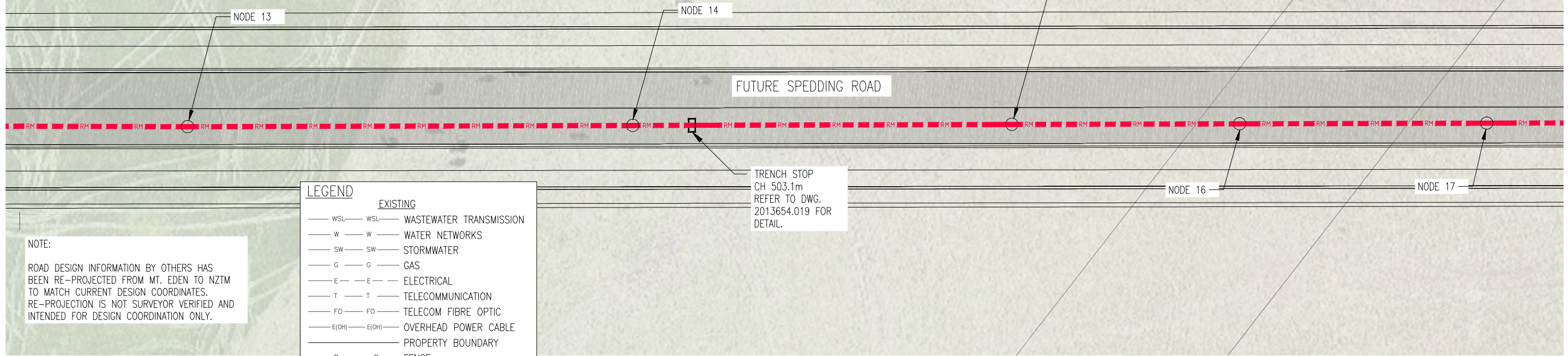
CAD FILE	2013654.004-016	DATE	09-09-22
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.007	ISSUE	5



**IMPORTANT SERVICES NOTE**

THE SERVICES SHOWN SHOULD BE CONSIDERED INDICATIVE ONLY AND ARE BASED ON RECORDS SUPPLIED BY THE UTILITY COMPANIES. PRIVATE SERVICES AND CONNECTIONS ARE NOT SHOWN.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL SERVICES ARE LOCATED/MARKED BY THE APPROPRIATE SERVICE AUTHORITY, OR THEIR OWN STAFF, PRIOR TO ANY SITE WORKS, AND FOR PROTECTING THESE SERVICES FOR THE DURATION OF THE SITE CONTRACT.

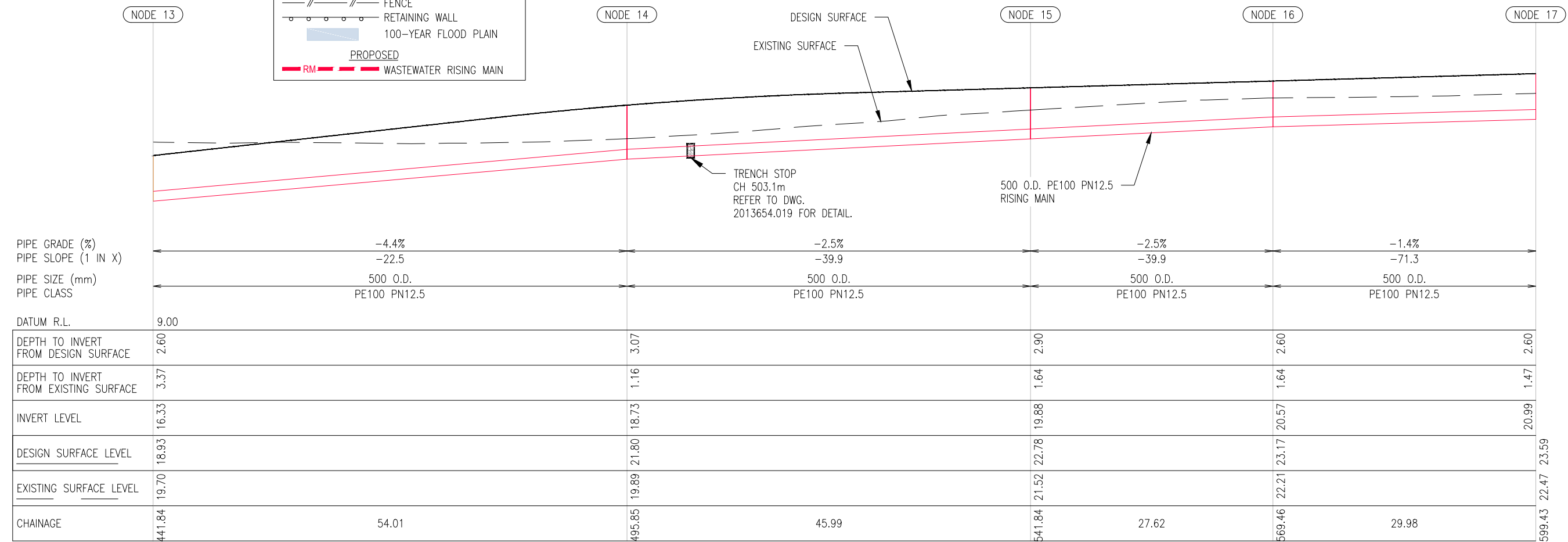


**NOTE:**

ROAD DESIGN INFORMATION BY OTHERS HAS BEEN RE-PROJECTED FROM MT. EDEN TO NZTM TO MATCH CURRENT DESIGN COORDINATES. RE-PROJECTION IS NOT SURVEYOR VERIFIED AND INTENDED FOR DESIGN COORDINATION ONLY.

**LEGEND**

EXISTING	
— WSL —	WASTEWATER TRANSMISSION
— W —	WATER NETWORKS
— SW —	STORMWATER
— G —	GAS
— E —	ELECTRICAL
— T —	TELECOMMUNICATION
— FO —	TELECOM FIBRE OPTIC
— E(OH) —	OVERHEAD POWER CABLE
—	PROPERTY BOUNDARY
— // —	FENCE
— [ ] —	RETAINING WALL
— [ ] —	100-YEAR FLOOD PLAIN
PROPOSED	
— RM —	WASTEWATER RISING MAIN



**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	BY	DATE
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	P. HOUGHTON	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. WANG	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	S. VASOL	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.	D. XIE	9-22
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL PROJ. LEAD		

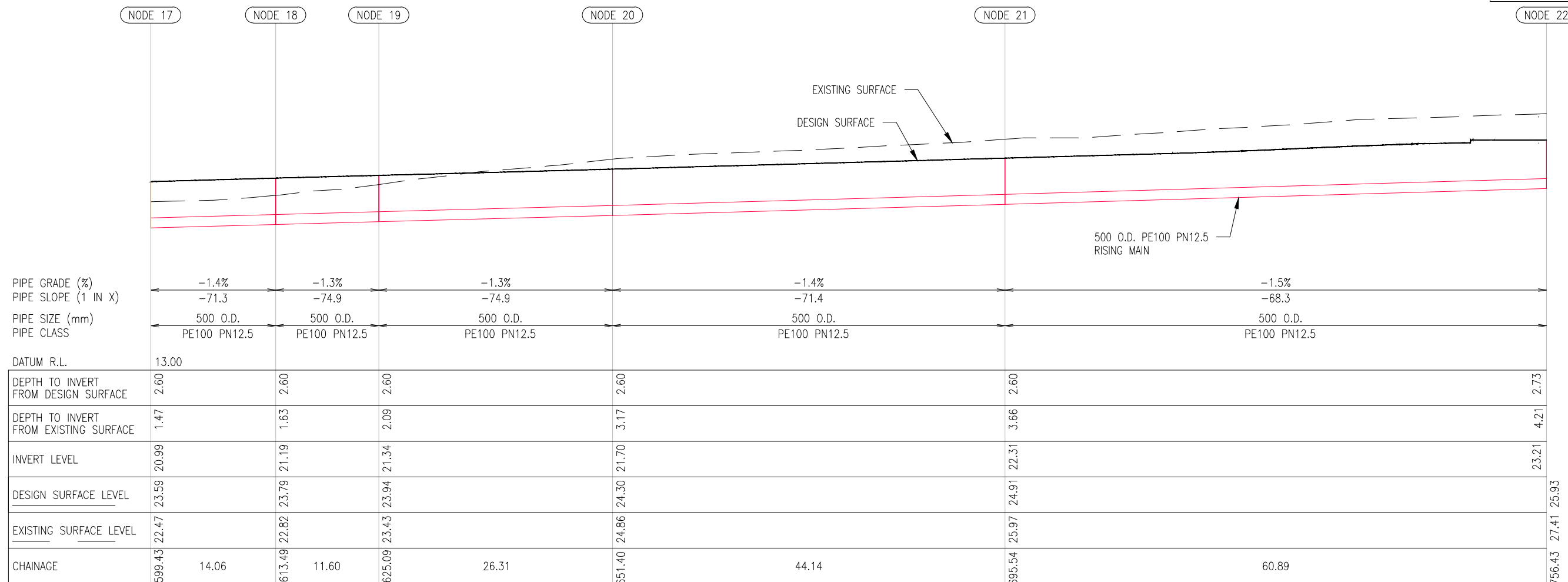
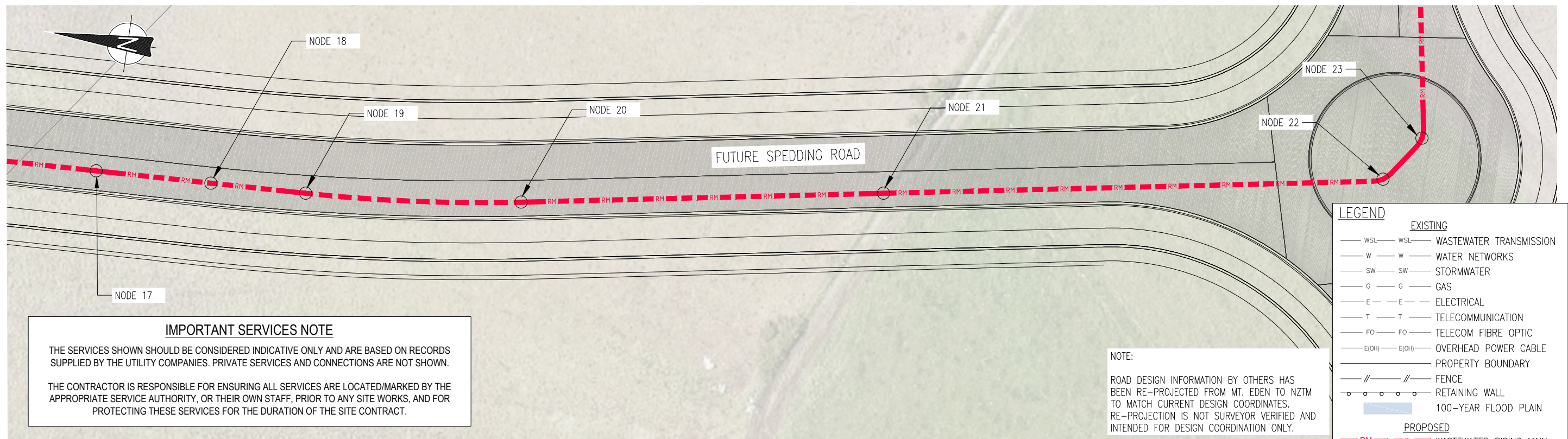
**Watercare**

COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI  
INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 4 OF 12



CAD FILE	2013654.004-016	DATE	09-09-22
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.008	ISSUE	5



**DETAILED DESIGN**  
NOT FOR CONSTRUCTION

ISSUE	DATE	AMENDMENT	BY	APPD.	DESIGNED	BY	DATE
5	9-22	UPDATED RISING MAIN ROUTE ALIGNMENT	S.V.	P.H.	DES. APPROVED	P. HOUGHTON	9-22
4	4-22	RE-ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DRAWN	S. WANG	9-22
3	12-21	ISSUED FOR DETAILED DESIGN	J.C.	P.H.	DWG. APPROVED	S. VASOL	9-22
2	8-21	RE-ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL DESIGN MGMT.	D. XIE	9-22
1	5-21	ISSUED FOR PRELIMINARY DESIGN	J.C.	P.H.	WSL PROJ. LEAD		

**Watercare**  
COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

WHENUAPAI-REDHILLS WASTEWATER SERVICING  
BRIGHAM CREEK ROAD, WHENUAPAI

INTERIM SLAUGHTERHOUSE PS - WASTEWATER RISING MAIN PLAN AND LONG SECTION - SHEET 5 OF 12



CAD FILE	2013654.004-016	DATE	09-09-22
ORIGINAL SCALE	A3 1:500	CONTRACT No.	6484-6934
REF No.	12508391   3-AWD32		
DWG No.	2013654.009	ISSUE	5