



15th May 2019

Our ref: 51/12504023/
DocNumber 001
Your ref:

Dear Sir,

**Request for Quotation
Muri WWTP Feasibility Investigation – Site Assistance**

The MTV-KTV Project Management Unit (PMU) on behalf of the Government of the Cook Islands, MFEM, is conducting investigations relating to a possible site for a Waste Water Treatment Plant (WWTP) and reticulated sewer system as part of the Mei Ti Vai Ki Te Vai (MTV KTV) project. The investigations include an Environmental and Geotechnical Investigation of a block of land on Rarotonga and potholing in the roadway for the purpose of service location.

WWTP Site Investigation

As part of this investigation the project team requires contractor assistance for the site investigation to clear vegetation to allow access to the testing locations, excavate test pits and locate services. The site is located in the Muri area.

The WWTP site investigation is likely to take two to three weeks depending on the scheduling of environmental and geotechnical engineers and may include the following tasks:

- Step 1. Joint site visit with the Engineer to confirm the scope of works.
 - a. During this site visit, the Engineer will confirm the extent of site clearance required.
 - b. During the site visit, the Contractor shall install markers (coloured timber peg or equivalent) to identify the extents of the site clearance.
- Step 2. Locate and mark out all services as required. Potholing may be required to confirm the alignment and depth of services prior to investigation.
- Step 3. Site clearance – general vegetation clearance including trimming of overhanging branches/trees as agreed with the Engineer.
- Step 4. Place stone, Gap 40-65 typical, to form access around site where necessary.

- Step 5. Excavate test pits for environmental and geotechnical investigation across the site at direction of the engineer.
- a. Excavations may typically be 1.5-4.0 m deep.
 - b. The excavations may require dewatering.
 - c. The excavations may require trench support
- Step 6. Refill excavated test pits and reinstate the site.

Reticulation Sewer Investigation in the main road, Are Tapu

The reticulation sewer investigation is expected to be completed within one week. It will include approximately 7 cross trenches dug from the centre line of the road to the property boundary, including the berm at the road edge to locate and identify all existing services. These will be perpendicular to the road centreline.

The tasks required by the contractor may include:

- Step 1. Provide a Traffic Management Plan and traffic management to ensure safety of the contractors and engineers working in the roadway.
- Step 2. Excavate potholes as directed to locate existing services in the road corridor. Hand excavation will be required to locate services.
- Step 3. Reinstate the excavated potholes following investigation of the exposed services in accordance with the attached Code of Practice for Utility Operators, Works within the Road Corridor, Section 5. See Attachment 3.

These investigations may not occur concurrently.

Rates Request

Please provide a rate for the items described in Schedule of rates. The quantities are indicative only and may be higher or lower depending on the extent of the works required on site.

The closing date for the return of tenders is Friday 24th May 2019 at 15.00 hours.

All enquiries shall be addressed to Martin Smith at the following email address:
martin.smith2@ghd.com;

Rates shall be returned either by hard copy delivered to the PMU Office or by email to Martin Smith at the email address above.

Contract Conditions

The successful supplier will be awarded a contract based on the Cook Islands Government Terms and Conditions for a Low Value Construction Contract.

See Attachment 1: Terms and Conditions for a Low Value Construction Contract

The total value of the contract will be based on the volume of work undertaken using the rates supplied in the attached schedule. The quantities in the schedule of rates are indicative only and are to be used to determine the total value of the works upon completion.

The works will be instructed by the Engineer as required to support the site investigation team.

See Attachment 2: Schedule of Rates

Rates will be evaluated by the PMU based on the submission and the availability of plant and labour.

It is intended for this work to be undertaken during the months of June and July 2019.

Payment will be made upon completion of the works. Progress payments will be allowed if the works is over a period greater than 4 weeks.

Sincerely
GHD Limited
Martin Smith

MTV-KTV PMU Project Manager

Attachment 1 Terms and Conditions for a Low Value Contract

TERMS AND CONDITIONS FOR CONSTRUCTION

The Cook Islands Government (“Government”) engages the Contractor, and the Contractor accepts the engagement, to perform the Services in accordance with these terms and conditions.

1. Application:

These terms and conditions supersede any contrary provisions in any previous agreements between parties, written or otherwise. No right under these terms shall be deemed to be waived except by notice in writing by each party. In the event that any one or more of the provisions contained in these conditions are declared invalid by order, decree or judgment of any Court of competent jurisdiction, these conditions are to be read as if such provision had not been inserted.

2. Standard of Services and Compliance

In performing the Services the Contractor shall:

- 2.1. Exercise the degree of skill, care and diligence normally expected of a competent professional;
and
- 2.2. Comply with all applicable statutes, regulations and codes applicable to the Services.

3. Information

The Government shall use reasonable endeavours to provide to the Contractor, free of cost, as soon as practicable following any request for information, all relevant information in its power to obtain which may relate to the Services. The Contractor shall not, without the Government’s prior written consent, use information provided by the Government for purposes unrelated to the Services.

4. Variations

The Government may order variations to the Services in writing or may request the Contractor to submit proposals for variations to the Services. No work pursuant to a variation may commence until the Services comprised in the variation and the Fees and Expenses for the variation are approved in writing by the Government.

5. Practical Completion

- 5.1. Practical Completion is defined as that stage in the execution of the work under the Contract when the Contract Works or any Separable Portion are complete except for minor omissions and minor defects:
 - a. Which in the opinion of the Authorised Representative the Contractor has reasonable grounds for not promptly correcting;

- b. Which do not prevent the Contract Works or Separable Portion from being used for their intended purpose; and
 - c. Rectification of which will not prejudice the convenient use of the Contract Works or any Separable Portion.
- 5.2. When the Contract Works or any Separable Portion are believed to qualify for Practical Completion the Contractor shall notify the Authorised Representative in writing accordingly.

6. Payment

- 6.1. Within 3 working days of the end of each month, and subject to the Contractor having first signed this Contract, the Contractor shall issue the Government through its Authorised Representative with a payment claim setting out the Fees and Expenses claimed for the previous month (less Retentions) and details of the Services provided. The Contractor acknowledges that it is not entitled to payment until it has signed this Contract.
- 6.2. Upon receipt of the payment claim, the Government shall review it and respond by way of a payment schedule within 10 working days setting out whether it agrees with the contents of the payment claim, and if not, the reasons why and the revised calculation of the amount payable.
- 6.3. Upon receipt of the Government's payment schedule, the Contractor shall issue a VAT tax invoice to the Government for the amount set out in the Government's payment schedule.
- 6.4. All amounts payable by the Government shall be paid on the 20th of the month following the month of receipt of the invoice. Any changes to approved Fees or Expenses, must first be approved in writing by the Government.
- 6.5. Upon achieving practical completion of the Services, as certified by the Authorised Representative, the Contractor must remedy all defects identified by the Authorised Representative both at practical completion and during the Defects Liability Period.
- 6.6. Upon expiry of the Defects Liability Period and the Contractor having satisfactorily remedied any defects in the Services, as certified by the Authorised Representative, and delivered all warranties, guarantees and other documentation required by the Government as part of the Services, the Contractor may issue a payment claim for the Retention held by the Government, which shall be subject to the process set out in 6.2 to 6.4 above.

7. Insurance

The Contractor is required to maintain the Insurance throughout the Contract Term and to use reasonable endeavours to maintain the same for the specified period after the completion of the Services. The Contractor shall provide an updated insurance certificate to the Government prior to the expiry of any relevant insurance certificate.

8. Intellectual Property

The ownership of data, factual information and intellectual property (including copyright) in all drawings, specifications and other documents and things created pursuant to this Contract and paid for by the Government shall, after payment by the Government, lie with the Government.

9. Suspension

The Government may suspend all or part of the Services by notice in writing to the Contractor who shall immediately make arrangements to stop the Services and minimise further expenditure. Suspension shall not prejudice or affect the accrued rights or claims and liabilities of the parties.

10. Termination

- 10.1. The Government may terminate (in its sole discretion) the Services by 10 working days' prior written notice to the Contractor.
- 10.2. Either party may terminate the Services by immediate notice if the other party materially breaches the Contract, including but not limited to the Contractor failing to perform the Services by the Completion Date or to the standard required by this Contract.
- 10.3. Termination shall not prejudice or affect the accrued rights or claims and liabilities of the parties.

11. Acknowledgement

- 11.1. The Contractor confirms and acknowledges that it:
 - a. Is qualified to carry out the Services;
 - b. Will deliver all guarantees and warranties (including manufacturer's warranties on products and materials) required as part of the Services to the Government prior to practical completion;
 - c. Will promptly remedy any defects in the Services provided upon written request from the Government;
 - d. Has no, and is not aware of any conflict of interest, that it has not disclosed in writing to the Government prior to signing this Contract and the Contractor undertakes to advise the Authorised Representative immediately if any conflict of interest should arise;
 - e. Is not the subject of any claim brought by any Government for defective workmanship, and will notify the Government immediately if any such claim is brought.

12. General

- 12.1. This Contract is governed by the Cook Islands law, and the Cook Islands courts have exclusive jurisdiction in respect of this Contract.
- 12.2. This Contract evidences the entire agreement between the Contractor and Government in connection with the Services and supersedes and extinguishes all prior agreements (including any quotes provided by the Contractor) between the Contractor and Government relating to such matters.
- 12.3. The Contractor may not assign the Contract without the Government's prior written approval.
- 12.4. The Contractor shall not sub-contract any part of this Contract or the Services without the Government's prior written consent.
- 12.5. The Government can set-off any amounts owing to the Contractor under this Contract against any amounts owing to the Government by the Contractor under this contract or any other Contract between the Government and the Contractor.
- 12.6. All notices to a party must be delivered by hand or sent by post, courier, fax or email to that party's address for notices set out in this Contract. In case of notice by email, confirmation of receipt from the recipient is required to confirm the delivery of the notice.

Attachment 2 Schedule of Rates



Attachment Two - Schedule of Rates

Schedule Item Number	Description	Unit	Estimated Quantity	Rate (\$ Excl VAT)
	WWTP Site Investigation			
1	Site Supervisor	hr	80	
2	Labourer One	hr	80	
3	Labourer Two	hr	80	
4	Small excavator (potholing assistance)	hr	40	
4.1	Mobilisation of item 4	LS	1	
5	20 tonne excavator (for excavation to approximately 4.5m depth)	hr	40	
5.1	Mobilisation of item 5	LS	1	
6	10 tonne truck	hr	20	
6.1	Mobilisation of item 6	LS	1	
7	Trench supports	LS	1	
8	Small dewatering pump	week	1	
9	Mess Facilities	week	1	
10	Site clearance for access to work areas	LS	1	
11	Security fencing around open excavation	LS	1	
12	Supply gravel to site for access tracks	m ³	50	
13	Mobilisation (excluding items 4, 5 and 6)	LS	1	
	Reticulation Investigation (In Roadway)			
14	Traffic management (for roadway investigation)	day	7	
15	Provision of Traffic Management Plan for locating services in road	LS	1	
16	Excavate potholes in roadway 0-1.5m depth, then reinstate to specification provided (excavation is from road centre to road corridor boundary)	Each	7	
17	Excavate potholes in roadway 1.5-2.5m depth, then reinstate to specification provided (excavation is from road centre to road corridor boundary)	Each	7	

**Attachment 3 Code of Practice for Utility Operators, Works within the Road Corridor,
Section 5.**



INFRASTRUCTURE COOK ISLANDS

**CODE OF PRACTICE FOR
UTILITY OPERATORS, WORKS WITHIN
THE ROAD CORRIDOR**

SECTION 5: Procedures for Working in Road Corridors

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5. Procedures for Working in Road Corridors

5.1 General Requirements

5.1.1 Works Access Permit

Not Applicable

5.1.2 Protection of Existing Assets (Road, Utility Structures, Survey Marks)

1. When undertaking Works in Road and Motorway Corridors, all Parties must:
 - a) take measures to ensure all existing Utility Structures that may be affected by site construction are not damaged during the course of the Work;
 - b) carry out its Work in a manner that protects the separation requirements of other Utility Operators as provided for in relevant codes and regulations;
 - c) maintain the integrity of, and not destabilise, any embankments or adjoining properties when they are working in or near and maintain safety distances for Utility Structures if they modify embankments or Road or Motorway surfaces; and
 - d) where survey marks are likely to be disturbed or damaged, the Government agency responsible for maintaining the survey marks must be notified and arrangements must be made to replace or offset the marks prior to the Work being undertaken.
2. Before undertaking Works, the Utility Operator must:
 - a) carry out a site assessment;
 - b) record the existing condition of all surfaces and above-ground Utility Structures in the immediate vicinity of the Work Site; and
 - c) take photos to record the pre-existing condition of the Work Site, particularly any existing damage.
3. All Traffic signal ducts, cables, chambers and poles affected by the Utility Works must be reinstated by the Utility Operator as soon as practicable and in any event within 48 hours of final reinstatement of the excavation in the immediate vicinity.
4. If damage is caused to any Road, property or utility assets:
 - a) the Utility Operator must notify the Road Manager and the respective Utility Operator of any damage caused to its assets or property as a direct result of the Work it is undertaking;
 - b) if it is not clear who or what was responsible for the damage, all relevant parties involved with the particular Works that have resulted in the damage must cooperate with the owner of the damaged assets in identifying the Party responsible for the damage;
 - c) noticeable settlement in Carriageways and Footpaths must be rectified; and
 - d) all other Road assets, properties and existing Utility Structures that are damaged by any Work must be repaired as soon as practicable after the damage occurs. The affected Utility Operator responsible for the Utility Structure or the Road Manager must decide who will carry out the repair Work.

Damage may include, but is not limited to, subsidence or settlement of Trenches or Road infrastructure, Road surface deterioration such as erosion of poor surface material, the appearance of the joint crack through the joint

sealing or pot holing of the adjoining surface at the edge of the Work. It also includes damage to any or all adjacent utility infrastructure affected by the Works and any vehicles or any other private property damaged during the implementation of the Works.

The Utility Operator is responsible for all Work it undertakes within the Road Corridor.

5.1.3 Preventing Silt Ingress

Not applicable. Refer Specific Environmental Management Requirements

5.1.4 Trenchless Construction

Not applicable

5.1.5 Working in the Vicinity of Trees

Not applicable. Refer Specific Environmental Management Requirements

5.1.6 Public Liability

The Road Manager may discuss with the Utility Operator the form, terms and value of the cover. The cover should be sufficient to indemnify the Road Manager against any claims of loss or damage to property of the Road Manager or Parties claiming against the Road Manager that may arise out of, or in consequence of, the construction or maintenance (or lack of) of the Works.

5.1.7 Emergency Contact Details

Prior to undertaking any Works, the Utility Operator must exchange contact details with the Road Manager for use in emergency situations.

5.2 Locating Existing Underground Utility Structures

5.2.1 General Procedures for Location

1. Before commencing Work, the Party undertaking the Work must:
 - a) identify and notify the Utility Operators and Road Manager and obtain requirements required for Work under, adjacent to or over their Utility Structures and Road Structures;
 - b) have located all affected underground Utility Structures and Road Structures, such as fibre cables etc, in accordance with the requirements of the Road Manager and Utility Operators responsible for their affected Utility Structures and Road Structures;
 - c) where excavations are required to locate the structures, employ safe digging practices; and
 - d) if the Party cannot locate an identified structure in close proximity to the identified location, notify the respective Utility Operator or Road Manager who is responsible for identifying or correctly locating its assets.
2. During underground Work, the Utility Operator must:
 - a) allow other Utility Operators to observe Work in close proximity to their Utility Structures; and

- b) ensure that any structure location markings are of a type that will not leave residue prints in the pavements and such markings are fully removed prior to the Works Completion Notice being lodged with the Road Manager.

All Parties should always assume that underground Utility Structures are present until it is proved otherwise.

Utility Operators with Utility Structures in proximity to the Works may assist by marking their service locations on the ground.

5.2.2 Finding Unmarked Assets owned by Others

Where a Party or its agent locates or exposes assets not shown (or shown inaccurately) on any plan:

- a) the Party must notify the owner of that asset of the true location, and the owner of that asset must amend its records and notify the Road Manager accordingly; or
- b) if the Utility Operator is unidentified, the Party must notify the Road Manager and the Road Manager must promptly try to identify and notify the Utility Structure's existence and location to the owner; and
- c) the Party that owns that Utility Structure must promptly provide any assistance reasonably required.

During underground Work, the Utility Operator should:

- a) make allowance for unforeseen delays due to the discovery of unmarked or unknown Utility Structures; and
- b) assume that there is a field (subsoil) drain located under all kerbs or water channels, at a depth of up to 1 m (these are not normally marked on plans).

5.2.3 Locating Traffic Signal Assets

Not Applicable

5.3 Site Management

5.3.1 General

1. The construction site must be clearly defined, and barricaded where appropriate, including any area of the Corridor used for storage or that does not have a proper temporary surface for public use.
2. The Utility Operator must also ensure:
 - a) the size of the Work and the Road portion of the site is kept as small as is reasonably possible;
 - b) the site is kept tidy at all times;
 - c) safe provision is made for all Road Corridor users including Traffic, pedestrians and cyclists;
 - d) disruption of access to properties adjacent to the site is avoided or minimised to the extent reasonably practicable;
 - e) stormwater and siltation control is managed; and
 - f) at completion, the area must be tidied and left in a similar condition to that which existed before the Works commenced.

5.3.2 Pollution Control

Utility Operators have a duty to comply with the Environment Act, including a duty to avoid unauthorised discharge of contaminants to open water channels.

Utility Operators should:

- a) identify environmental risks and include sufficient written instructions and supervision included in their contracts to avoid discharges of contaminants to the environment from its own or Contractor activities;
- b) ensure that the Contractor is aware of the potential issues and has appropriate action plans; and
- c) protect ground and surface water from point source pollution and minimise any impacts on waterways.

5.3.3 Traffic Management

1. The Utility Operator must implement the approved TMP, agreed as part of the corridor access process, throughout the duration of the Works.
2. If a Work Site audit shows that the Traffic management does not comply with the above or any other condition, the Utility Operator must remedy the non-compliance immediately, or cease working until authorised to recommence, except for that Work required to ensure the safety of the Work Site.
3. The Utility Operator must follow all instructions given by an officer of the CI Police in respect of Traffic management, except that any Work Site ordered closed must be made safe before it is vacated.

5.3.4 Hours of Work

Hours of Work must be:

- a) agreed between the Parties or specified in the Reasonable Conditions; and
- b) carried out outside peak Traffic flows (except for Emergency Works), unless otherwise agreed.

Hours of Work may be restricted to limit interference with property access, or to minimise noise, other environmental impacts and Traffic congestion. Where the Hours of Work may be severely restricted the Parties may agree on special arrangements to work extended hours.

5.3.5 Noise and Vibration Management

The Utility Operator must:

- a) resolve excessive noise and vibration conditions where they occur as a result of the Works.

Utility Operators should:

- a) address noise management in its Work planning;
- b) muffle all plant and equipment in accordance with good industry practice;
- c) avoid unreasonable nuisance and use methods that minimise noise levels, such as avoiding the use of breakers and other similar loud noise when required to work at night; and

- d) take additional care when undertaking Work adjacent to asbestos pipes, as these are prone to failure when subjected to vibration.

5.3.6 Public Relations and Communication

All Parties must keep affected parties appropriately informed of proposed Works and Works in progress.

Appropriate communications may include:

- production and distribution of a suitable leaflet advising the Public of the forthcoming project at before Work starts;
- advertisement/public notice in specified local newspapers at least two Working Days before Work is started; and
- advertisement/public notice on specified local major radio stations in advance of the Work and throughout the period of the Work (typically before and during peak Traffic times).

5.3.7 Signage for Works in Road Corridors

No Signage other than that to be provided as part of the Traffic Management requirements is to be installed on site without the approval of the Road Manager.

5.4 Procedures for Undertaking Emergency Works

1. In carrying out Emergency Works, the Utility Operator must:
 - a) comply with any legislative provisions relating to Emergency Works;
 - b) before starting Work, secure the working area and apply safety measures to protect workers and the Public; and
 - c) identify the location of other Utility Structures prior to Works starting.

In the event of an Emergency, the Road Manager should determine (in discussion, where possible, with other affected Utility Operators) the appropriate course of action to ensure the community's needs are best served.

The development of agreed processes for use by the Parties in Emergency Works is encouraged.

5.5 Trenching Procedures

5.5.1 General

Utility Operators must operate and manage Work Sites with Trenches:

- a) to protect public safety at all times;
- b) to avoid impacts on other assets (for example, collapse of kerbing support);
- c) in compliance with all other requirements of this Code.

5.5.2 Trench Cutting and Excavation

1. Prior to the excavation of the Trench:

- a) any concrete, asphalt or chip seal surfaces must be cut with a power saw in a clean, straight line through the full thickness of the surface layer;
- b) the separation distance from the original saw cut (the trimming allowance, refer Figure 5-3) must be a minimum of 150mm, except for concrete Carriageways where a minimum of 300mm applies, but more may be required to maintain the integrity of the final Trench reinstatement;
- c) if necessary, a second saw-cut must be made to ensure that all edges are straight, smooth, parallel to the line of the Trench and that minimum Trench trimming allowance is achieved; and
- d) all joints must be cut to a depth sufficient to avoid disturbance of adjoining pavement. The depth of cutting must be not less than 30mm, or for concrete Carriageways, Footpaths and vehicle crossings the depth must be not less than 80% through the concrete pavement layer.

When planning the location of the trenching ensure that all the requirements of Section 5.6 (Surface Layer Reinstatement) can be met.

2. If any over-break occurs:

- a) a further cut must be made to maintain trimming allowances and a clean edge for reinstatement;
- b) any change in direction of the saw cut must not exceed an angle of 45° to the Trenchline;
- c) the total length of over-break must not exceed 10% of the length of the Trench; and
- d) the length of trim at any one section of over-break must not be less than 5m (refer Figure 5-4).

3. During excavation of the Trench:

- a) there must be no undercutting of areas adjacent to the excavation;
- b) if slumping at the sides of the excavation causes depressed areas adjacent to the excavation, or if the edges of the pavement are lifted during excavation, additional Trench cutting outside the original line of the excavation and outside the area of damage must be carried out;
- c) excavation to profile/depth must be in accordance with the construction drawings;
- d) the length of open Trench must be kept to a minimum and backfilled as soon as practicable;
- e) excavated material that is not being used for backfill must be removed from the site;
- f) where groundwater is likely to accumulate as a result of Utility Works, excavations must be permanently drained; and
- g) the Utility Operator must provide temporary support/shoring to all Trenches if required to provide lateral support to the excavation and to comply with health and safety requirements. Alternative Trench support can include battering, ground stabilisation and sheet piling.

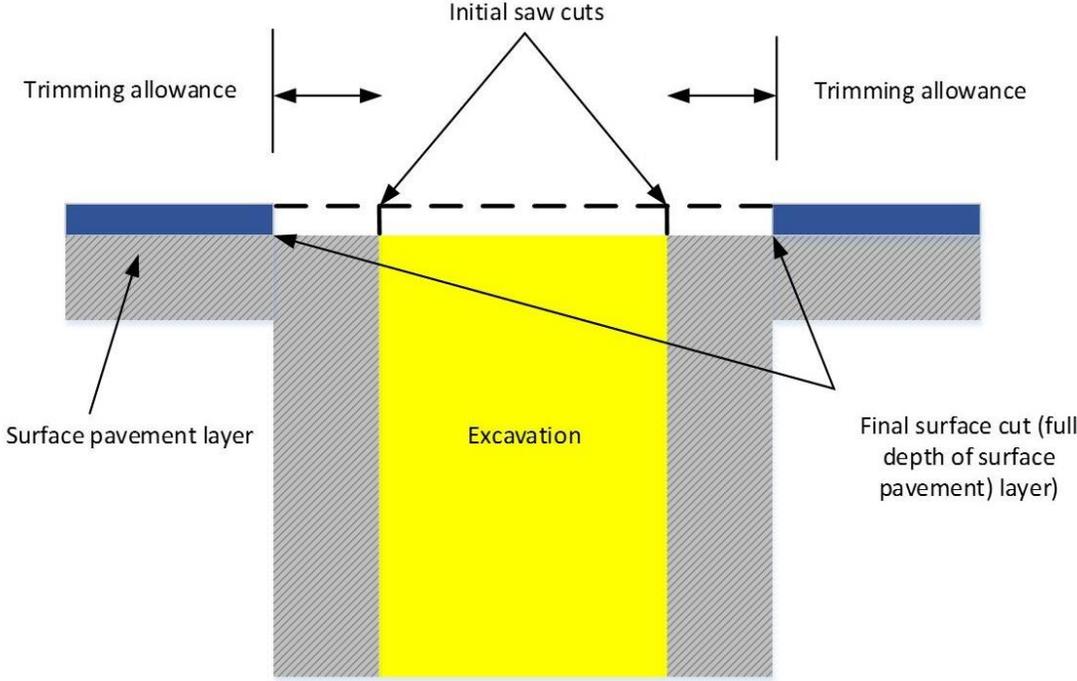


Figure 5-3: Standard trimming for Trench cuts

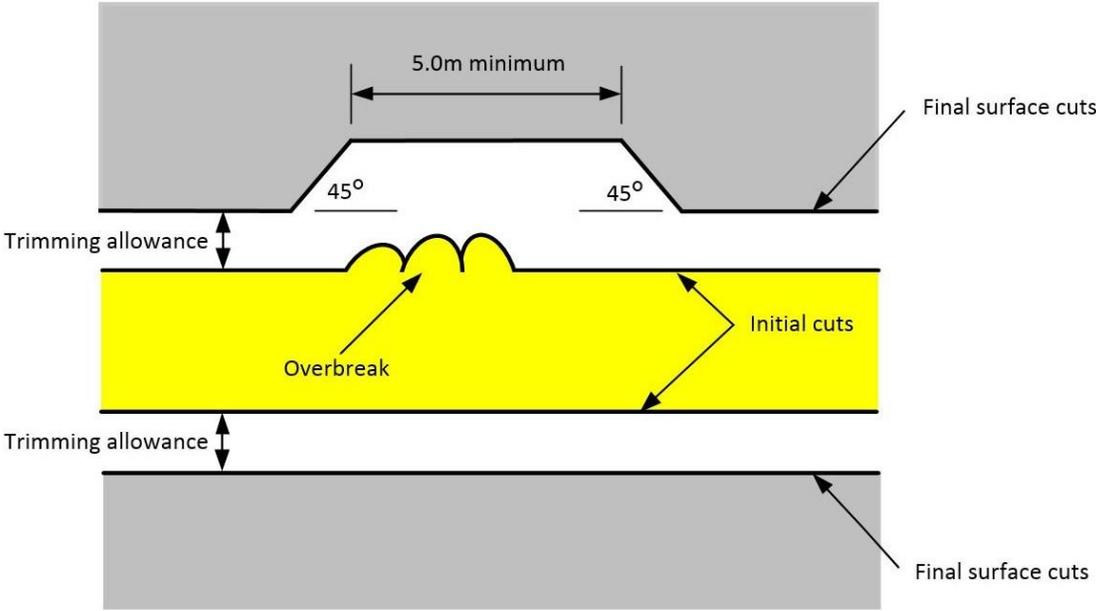


Figure 5-4: Parallel cutting of joints

- 4. After backfill and prior to surface reinstatement, the Utility Operator must re-cut surfaces if required, to achieve a neat simple pattern for reinstatement and to maintain minimum trimming allowances. Generally this will mean parallel saw cuts on the sides of any area.
- 5. When a Trench turns a corner, additional allowances must be made, as shown in Figure 5-5.

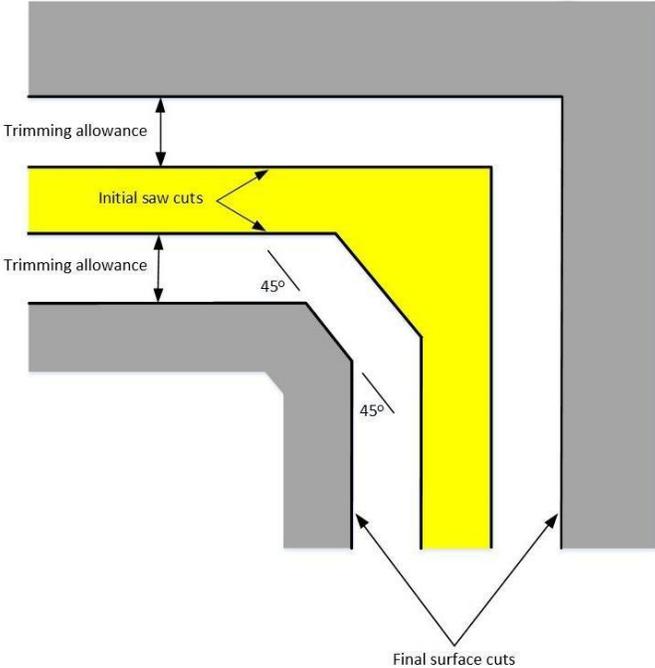


Figure 5-5: Trench excavation with corners

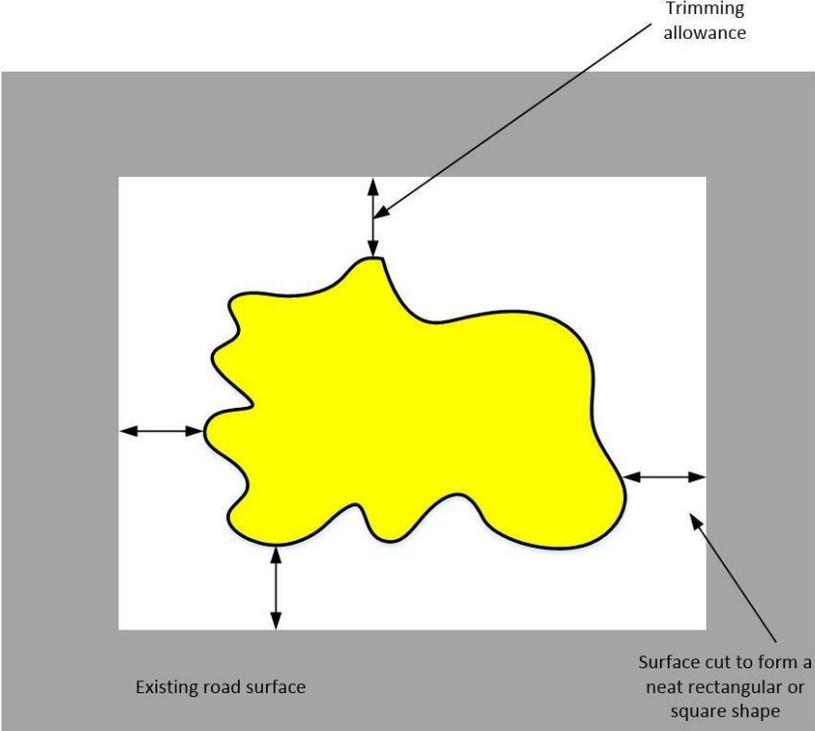


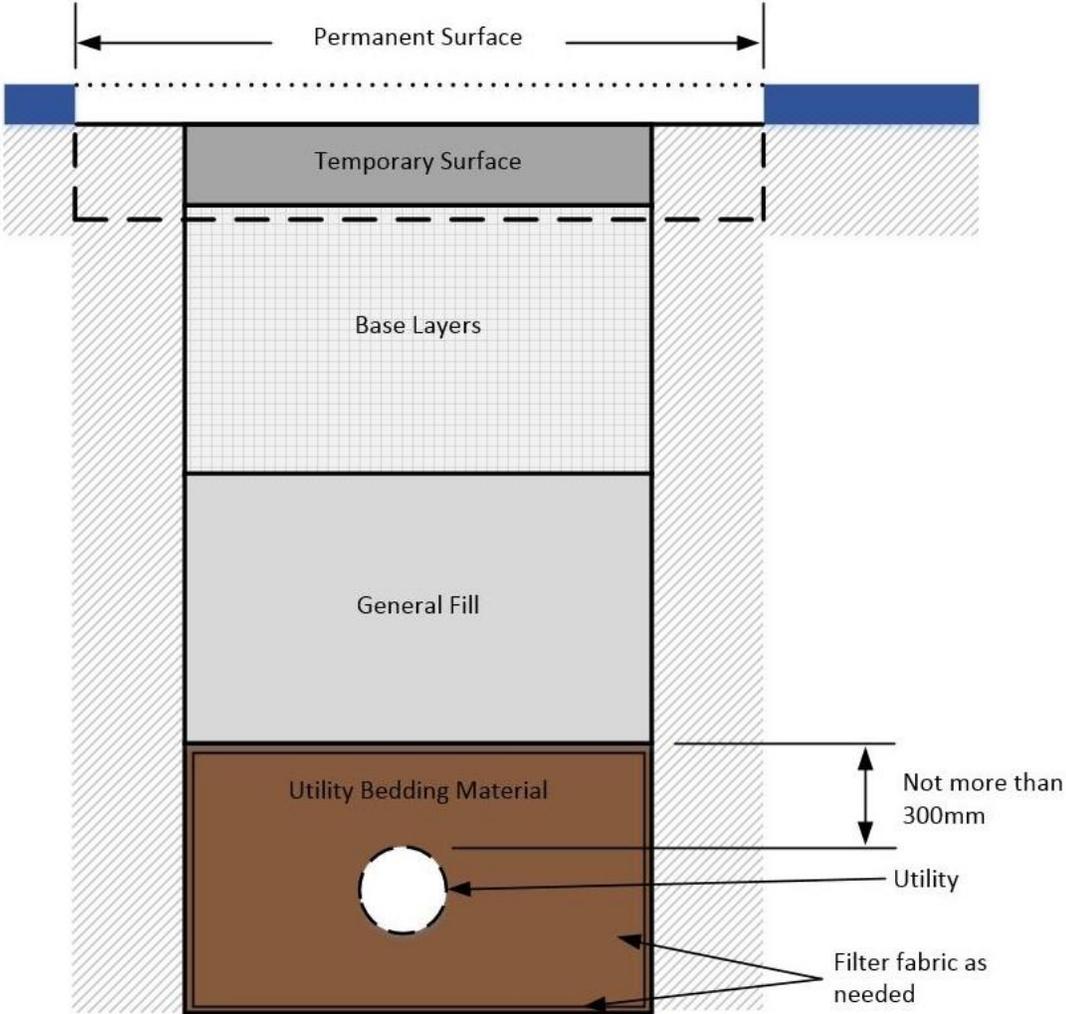
Figure 5-6: Finishing of irregular shaped excavations

Figure 5-6 is an example of how an irregular excavation should be expanded to form a more regular shape to minimise disruption to the surface.

5.5.3 Backfill Materials

1. All backfill materials:
 - a) must be in accordance with recognised standards and approved by the Road Manager;
 - b) must be adequate to ensure that the backfilled area can at least match the pre-Trench subsurface integrity;
 - c) must be of sufficient quality and strength to support the imposed loading, including Traffic and Road construction loading;
 - d) where concrete or other stabilised layers, including geotextile material, exist in the Road pavement, the Utility Operator must reinstate the Trench with similar material (further guidance on concrete reinstatement is included in Section 5.6.4); and
 - e) must be neutral or beneficial in effect on any other Utility Structures with which there will be interaction.
2. Thermally-stable backfill:
 - a) where thermally-stable backfill is required (typically for power cables), the Utility Operator, power cable owner and Road Manager must agree on the compaction and standard; and
 - b) when excavations make contact with Trenches of power cables laid in thermally stable backfill, the Utility Operator must restore the thermally stable backfill to the standards applying before the excavation.

Figure 5-7 illustrates typical Trench zones, with requirements for each zone detailed below.



Note: Maximum allowable compaction lifts for construction of each layer and overall layer thickness will be dependent on the underlying material strength, the material saturation of the layer, and the properties of the pavement material being used.

Figure 5-7: Fill layer in Trench

- 3. The bedding material must be specified by the Utility Operator and placed:
 - a) in a loose state (sand must be dampened) and tamped to achieve compaction and surround of Utility; and
 - b) to a depth of not more than 300 mm above the top of the Utility Structure, unless a variance is agreed between the Utility Operator and Road Manager.
- 4. General fill:

- a) in Road Carriageway, Shoulder and Footpath, general fill must be well graded granular material free of deleterious material with maximum stone size 75mm;
 - b) where the Utility Operator uses suitable excavated material in Berms, the required compaction standards must be achieved (refer Section 5.5.5).
5. Base layers – Road Carriageways: where there is more than one base layer:
- a) the lower base layer (sub-base) material must be well-graded crushed granular, with maximum aggregate size 65mm, and a controlled grading curve and weathering and crushing resistance; and
 - b) the upper base layer (basecourse) for the Carriageway, or the whole basecourse if it is a single layer, must comply with NZTA specification TNZ M/4: Basecourse aggregate unless the Road Manager has approved an alternative basecourse product specification.
6. Base layers – Footpaths: must be well graded GAP40 granular material.
- Berms generally do not need a separate base layer other than general fill.
7. Prior to backfilling, excavated material that is unsuitable for backfilling must be removed from site and not be used to backfill Trenches.

5.5.4 Backfill Placement and Compaction

1. Placement and compaction of all layers must:
 - a) be in layers not exceeding 200 mm (compacted) thickness;
 - b) allow for appropriate compaction methods around the Utility Structures;
 - c) have mechanical compaction completed for each subsequent layer in turn; and
 - d) ensure lapping of any geotextile material in accordance with the manufacturer's specification.
2. During backfilling and compaction:
 - a) care must be taken to ensure no damage occurs to Utility Structures during compaction; and
 - b) if over break or other disturbance of the pavement layers occurs, the surface of such areas must be re-cut, excavated and backfilled in compliance with this Section.

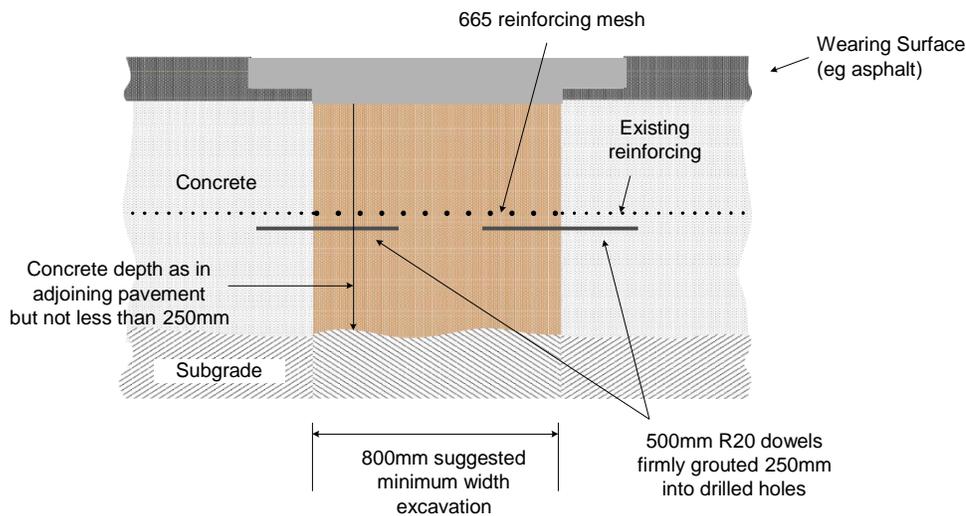
Where the strata exposed as side walls of a Trench is considered relatively soft, such that there may be risk of settlement arising from ongoing post-construction penetration of the granular fill material into the Trench sides, the Utility Operator should discuss backfill options with the Road Manager. These may include, for example, the application of a geo-textile liner in the Trench, or the use of modified (lime or cement-treated) granular materials in the vicinity of the soft layer/s.

3. Compaction must:
 - a) be carried out using suitable plant and equipment to achieve the specifications in Section 5.5.5; and
 - b) be confirmed by a Clegg hammer, or an agreed alternative.

The use of a nuclear densometer or similar compaction testing device should be considered for larger excavations in Carriageways.

4. When reinstating excavated concrete layers in the Carriageway, the Utility Operator must ensure that the new concrete:

- a) retains at least the performance characteristics of the existing layer;
 - b) is installed at a minimum depth of 250mm;
 - c) has a 28-day compressive strength of 20 MPa;
 - e) is manufactured in accordance with New Zealand Standards NZS 3104: 2003, Specification for concrete production – High grade and special grade or NZS 3109:1997, Concrete construction;
 - f) interlocks with the old concrete using R20 steel reinforcing bars placed centrally perpendicular to the face at 500 mm spacings along all joint faces. The bars must be bonded 250 mm into the existing concrete and extend into the new concrete a minimum of 250mm. The concrete must be reinforced with 665 steel mesh placed centrally. Where expansion or contraction joints are affected these must be reinstated; and
 - g) has a coarse broom finish surface and matches the line and crossfall of the Road surface, with allowance for asphalt overlay to be placed to the same thickness as on adjacent pavement as appropriate.
5. When reinstating concrete in any other areas, the concrete used should be of similar type and finish as the adjacent concrete.



Elevation

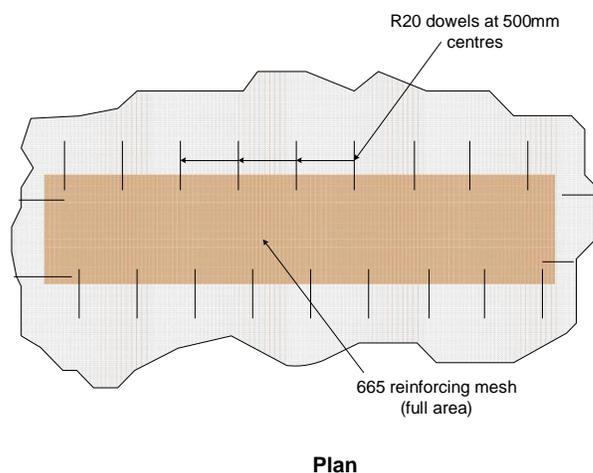


Figure 5-8: Concrete Road Carriageways

5.5.5 Compaction testing

	Carriageway	Footpath	Berm
Basecourse	98% MDD or IV 40	IV 30	N/A
Sub-base	95% MDD or IV 30	IV 30	N/A
Deeper Fill	IV 25	IV 15	IV 10

IV = impact value

Table 5-1: Compaction testing

1. Compaction testing must be carried out:
 - a) by a suitably qualified person;
 - b) using equipment with a current calibration certificate;
 - c) as specified in the Reasonable Conditions and Quality Plan; and
 - d) as necessary to achieve the standards in Table 5-1 at all depths of any backfill.

A lesser compaction for sand may be approved by the Road Manager if it can be clearly shown that the compaction is at least as much as the undisturbed sand in the adjoining ground. In the case of low volume roads a minimum impact value of 35 for carriageway base course may be accepted by the Road Manager as an alternative to specifying a maximum dry density (MDD).

2. A testing regime must be carried out as agreed with the Road Manager, or, in the absence of any agreement, as outlined below:

- a) for Trenches in Berms, tests at a rate of at least one test per layer of backfill per 15m of Trench, with a minimum of two tests;
 - b) for Trenches in Carriageways or under Footpaths, tests at a rate of at least one test per layer of backfill per 5m of Trench with a minimum of two tests;
 - c) where the excavated area is greater than 0.5m² and less than 5m², tests at a rate of one test per backfill layer or, for larger excavations, one test per 5m²;
 - d) all test locations must be uniformly spaced in the pavement; and
 - e) tests must be carried out on every lift of each tested backfill layer to be assured of proper compaction of all of the backfill.
3. The above specifications do not remove the responsibility of the Utility Operator to ensure that no settlement occurs.
- Also note that:
- Subject to satisfactory test results the above frequency of testing may be reduced with the prior agreement of the Road Manager;
 - The Clegg hammer may be used for testing of general fill and base layers of Carriageways;
 - Clegg hammer tests only indicate the compaction of the lift last laid of any backfill layer. The impact tester method covers material of 37.5mm and down and may not be suitable for sub-base material with larger stone sizes.
4. The Utility Operator must retain the test records and make them available to the Road Manager on request.

5.6 Surface Layer Reinstatement

5.6.1 General Requirements

1. The Utility Operator must:
 - a) use suitably qualified and experienced persons for the construction of Road surfacing; and
 - b) comply with this Code and relevant industry standards.
2. The Utility Operator must, unless otherwise agreed with the Road Manager:
 - a) not open Trenched sites to Traffic until temporary or permanent resurfacing is in place;
 - b) not use temporary resurfacing unless permanent resurfacing is not practicable; and
 - c) have permanent resurfacing in place within seven days of completion of backfill or temporary surfacing.
3. The Utility Operator must ensure the reinstated surfacing:
 - a) is installed in clean, long, straight lines parallel to the kerb or Footpath, or for transverse Trenches, perpendicular to the kerb and channel;
 - b) uses materials that match the surrounding surface in type, quality, texture, skid resistance and strength;

- c) matches at least the pre-existing surface in smoothness or ride quality for vehicles (vertical movements);
 - d) has a finished surface level and adjoining surface shaped to avoid ponding of surface water, such that the deviation of the surface from a 3m straight edge does not exceed 5mm;
 - e) does not create a lip greater than 5mm where it joins existing seal on Carriageways;
 - f) is continuously graded towards stormwater drainage channels or gully entries;
 - g) has no lips greater than 3mm high in pedestrian surfaces; and
 - h) be constructed to have a durable and functional life at least equivalent to the residual life of the existing pavement, as determined in consultation with the asset owner.
4. If the Road Manager requires a Road surface level survey prior to Work commencing, the Utility Operator must at its own cost carry out a survey that:
- a) measures the surface level at 5m intervals on each kerb and immediately around the proposed excavation; and
 - b) is accurate and has sufficient offset marks for levels to be re-established at the same points at any stage of the Work.
5. At the Road Manager's request, the Utility Operator must carry out Road surface roughness testing on a before-and-after basis for large projects.

5.6.2 Reinstatement near a Joint or Edge

If the edge of the final surface cut, inclusive of the excavation/trench trimming allowance, in a Footpath or Road Carriageway is within 1m of a joint or existing edge of the pavement, then the existing pavement must be replaced to that joint or edge as part of the surface reinstatement, and cut accordingly.

This requirement is commonly referred to as the '1 m rule' and is illustrated in Figure 5-9 and Figure 5-10. However the Road Manager may waive the requirement to extend reinstatement to a construction joint in a concrete surface when the concrete is significantly cracked.

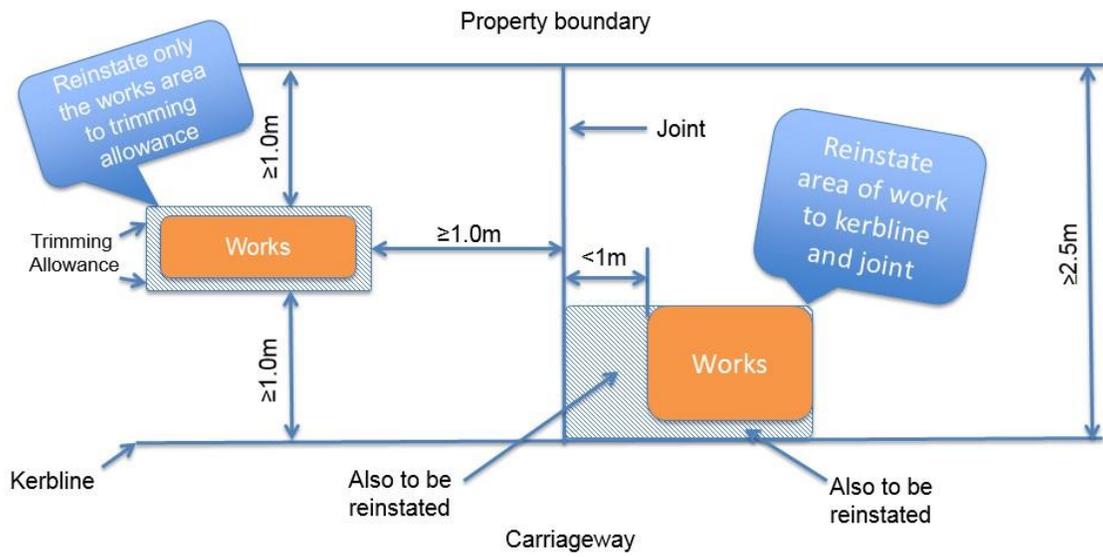


Figure 5-9: Excavation in Footpath or driveway

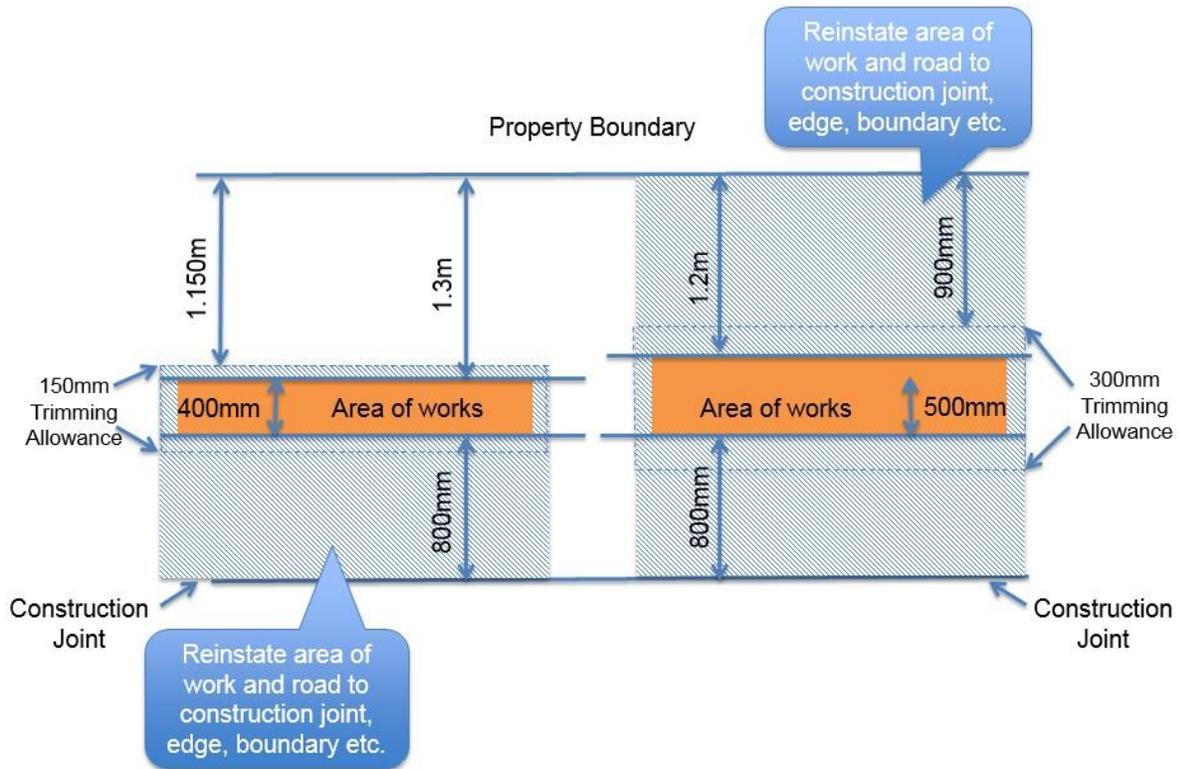


Figure 5-10: Reinstatement of concrete path or driveway

5.6.3 Temporary Surface Reinstatement

1. Temporary surfaces constructed by the Utility Operator must be:
 - a) 'cold mix' asphalt or an equivalent approved by the Road Manager;
 - b) at a surface level must be between 5mm below and 15mm above the original surface level, with a lip not greater than 5mm in any part of the surface;
 - c) laid in a manner and to a depth that is durable for both vehicular and pedestrian use;
 - d) maintained by the Utility Operator until permanent surfacing has been undertaken, including undertaking any repairs as soon as possible if damaged; and
 - e) fully removed prior to reinstatement with permanent materials.
2. Where the Utility Operator considers that special circumstances (but not at pedestrian crossings) require leaving an area of Road Carriageway and Footpath without a proper temporary surface, the Utility Operator must:
 - a) seek prior agreement from the Road Manager;
 - b) provide additional 'Uneven Surface' and 'Speed Restriction' signage;
 - c) maintain the surface within agreed tolerances of the surrounding surface level; and
 - d) reinstate the surface with a proper temporary surface within one Working Day or as agreed with the Road Manager.
3. Where steel plates are used, they must:
 - a) be in place for no more than seven days or as agreed with the Road Manager;
 - b) have their use approved by the Road Manager;
 - c) be securely fixed in place to prevent dislodgement and to not be a nuisance or danger to passing Traffic (vehicles, pedestrians, cyclists) users of local properties;
 - d) be skid resistant, secured and cushioned to prevent them from rocking, moving or creating noise;
 - e) be of sufficient strength and quality to support imposed Traffic loading;
 - f) have appropriate signposting with temporary speed restrictions and hazard warnings (refer CoPTTM);
 - g) have a ramp formed and filleted to ensure safe pedestrian and vehicular access; and
 - h) have any temporary markings required by the Road Manager.

5.6.4 Specific Requirements for Different Surface Types

1. Asphaltic concrete surfaces shall be designed and constructed in accordance with NZTA specification M10 2014.
2. Open graded porous asphaltic surface must comply with the following requirements:
 - a) Not Applicable
3. Structural asphalt concrete surfaces must:

- a) be specifically designed and constructed to restore the structural integrity of the original pavement; and
- b) have reinstatement details approved by the Road Manager.

Joint sealing, tack coats and/or joint bandaging, as necessary, should be part of the proposed methodology for approval, and guidance is included in the Chipsealing in New Zealand Handbook

4. Chip seal Carriageways must:

- a) be reinstated using a two coat chip seal; the first coat must be a coarse grade chip (e.g. Grade 3) and the second coat a finer grade (e.g. Grade 4 or 5) to visually blend with the existing adjacent surfacing. The second coat must overlap the existing surface by not less than 100mm;
- b) where the area being reinstated is adjacent to a concrete channel, the new seal must overlap the channel by a minimum of 50mm; and
- c) be laid in accordance with the NZTA specification TNZ P/3: First Coat Sealing and the Chipsealing in New Zealand Handbook.

5. Texturised asphalt reinstatement must:

- a) be laid in accordance with the NZTA specifications TNZ P/4: Resealing or TNZ P/17: Performance Based Specification for Bituminous Reseals; and
- b) within one year of the initial reinstatement, the area must be texturised with a single or two coat chip seal, with chip size selected to visually blend with the existing adjacent surface. The seal coat must overlap the existing surface by not less than 100mm.

Instead of the Utility Operator carrying out the Work, the Road Manager and Utility Operator may agree an equivalent fee to transfer the responsibility for texturing to the Road Manager.

6. Segmental block paved surfaces must:

- a) be reinstated in the same materials and to a standard at least equivalent to the original surface in accordance with NZS 3116;
- b) be laid in accordance with the requirements of the manufacturer and the Road Manager;
- c) have any chipped or damaged blocks replaced with the same type; and
- d) where reinstating around surface features in coloured concrete to match blocks (if agreed with the Road Manager), the concrete must not extend more than one block length from the base of the pole or feature.

To re-establish a tight interlocking pattern with specified joint widths, it may be necessary to remove adjoining blocks and relay them up to a bordering physical feature such as the Road kerb.

7. Concrete pavement surfaces must:

- a) be no less than 1m in any horizontal dimension in order to provide sufficient mass;
- b) match adjacent concrete paving depth but be no less than 100mm in depth (vehicle crossing depths may vary between RCA's. Check with your Road Manager);
- c) have reinforcing replaced to the same standard as the existing reinforcing;

- d) have a strength no less than 20MPa at 28 days. Admixtures may be used to attain the required strength earlier;
- e) match the surface finish of adjacent areas and if not being overlaid should be broom finished; and
- f) have construction joints formed to match those existing or be installed at minimum 4m centres.

Utility Operators installing small property connection or service points in concrete surfaces should work with the Road Manager to agree methodology to enable the surface cut size to closely match the service cover size in a manner which will not cause failure. The 1m rule will still apply (refer to Section 5.6.2).

5.6.5 Special Paving, Amenity Areas and Decorative Areas

1. Special Paving Areas must:

- a) be reinstated by a specialist Contractor;
- b) match the original standard, with the same quality, texture, type, colour and material of the existing pavement and minimal visible evidence of the Trench reinstatement;
- c) have the whole panel replaced, where the paving is laid out in panels;
- d) match any special treatments used in the existing construction (e.g. geogrid membranes, chip seal, high friction surface, grooved asphaltic concrete); and
- e) use alternatives agreed with the Road Manager, where matching materials are not available.

Some treatments such as geogrids need extended excavation to properly anchor the product.

2. Amenity and special decorative areas must:

- a) be reinstated by a Contractor approved by the Road Manager;
- b) match the original standard, with the same quality, texture, type, colour and material as the existing pavement with minimal visible evidence of the Trench reinstatement; and
- c) have any urban design features, architectural finishes, gardens, artworks and landscaping properly reinstated to the pre-existing condition.

5.6.6 Road Markings, Signs and Furniture

1. The Utility Operator must ensure that road markings are:

- a) recorded prior to being impacted by Works, including description of markings by type, their location and any special items;
- b) located by way of an offset at the side of the Road to enable accurate remarking; and
- c) reinstated prior to completion of Works and, in urban areas, preferably prior to reopening the lane or road to Traffic.

The Utility Operator should take photographic evidence of pre-existing markings where significant impacts on markings are expected. The Road Manager may hold records of existing road markings and, if so, should make this available as required.

2. The Utility Operator must ensure that temporary road markings, where required for Traffic safety purposes, are:
 - a) of an approved type and suitable for the purpose as specified by the Road Manager;
 - b) in place prior to Traffic usage of the Road surface areas affected;
 - c) in an effective condition for the period of use until the permanent situation is established;
 - d) fully removed prior to re-opening the area; and
3. The Utility Operator must ensure that signs, furniture and lids:
 - a) are protected and maintained during the Work;
 - b) are replaced if they become damaged or lost prior to completion of the Work; and
 - c) have utility chamber lids and covers restored to the finished road level.

The Road Manager may carry out reinstatement of signs and markings on behalf of the Utility Operator and at the Utility Operator's cost, if agreed between both Parties or if not reinstated within a reasonable timeframe.

4. The specification, location and marking of fire hydrants must be in accordance with SNZ PAS 4509, Appendix L.

The Utility Operator must ensure that:

- a) fire hydrant box lids are not covered over during Works;
- b) fire hydrant box lids remain identifiable during Works;
- c) full markings indicating the location of fire hydrants are visible before the Utility Operator leaves the site.

Temporary markings include:

- a) the yellow fire hydrant box lid;
- b) an indicator plate or marker post at the edge of the road or Footpath

Some markings may not be affected, such as painted hydrant covers, which would serve as temporary markers until full markings were reinstated.