

MODULE 5A: **Specification of ground improvement for residential properties in the Canterbury region - Appendices 3, 4 and 5**

Refer Module 5A for the document status and other details.

Appendices 3, 4 and 5 Preface

Contents:

- Appendix 3 – Methods of Measurement & Basis for Payment
- Appendix 4 – Example Schedule of Prices
- Appendix 5 – Example Drawings

It has been assumed this document will form part of a contract document under a General Condition of Contract NZS3910 (2013) and the terminology in this document is consistent with that standard. The terminology with this document may need to be modified if another form of contract is used.

The Preface does not form part of a contract document and should be deleted prior to inclusion in a construction contract document

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APPENDIX 3. **METHODS OF MEASUREMENT & BASIS OF PAYMENT**

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Methods of Measurement & Basis of Payment

For a Measure and Value Contract the Contract Price is determined with reference to the measured quantities of work actually carried out by the Contractor in accordance with the provisions of the Contract.

The quantities set out in the Schedule of Prices are estimates only of how much of each kind of work is included in the Contract. Such quantities will not be considered as final measurements. All work will be measured by the Engineer, in the field or from the Drawings, upon completion of the relevant work. Payment will be at the rates entered in the Schedule of Prices or at prices otherwise determined in accordance with the terms of the Contract.

The Contractor shall not use the Schedule of Prices for ordering.

Except where qualified otherwise in this Section and/or the Specification, measurements will generally be determined in accordance with NZS 4224:1983, "Code of Practice for Measurement of Civil Engineering Quantities".

Earthworks volumes will be calculated using the method of end areas. Prismoidal corrections will be used where judged appropriate by the Engineer. The positioning of sections will be appropriate to the shape and scale of the volume being measured to satisfy the Engineer that volumes are reliably measured.

The descriptions entered against the items in the Schedule of Prices are given only to identify the items. Reference must be made elsewhere in the Contract Documents for a full description of the work and general liabilities covered by the rates and prices entered against each item.

Clause numbers in "Methods of Measurement & Basis of Payment" refer to the corresponding item numbers in the "Schedule of Prices".

The items in the Schedule of Prices together with the rates and sums entered against each item cover everything necessary for the completion and maintenance of the Works. Items have been provided in the Schedule of Prices for all major operations, and the rates and sums entered against them cover all accessories and minor items together with the cost of complying with all general obligations imposed by the Contract.

Except where identified separately in the Schedule of Prices, all miscellaneous items, supervision, contingencies, maintenance, conveyance of plant and incidental work, plus general overhead administration are incorporated in the rates and sums entered in the Schedule of Prices. All rates and sums entered in the Schedule of Prices are proportioned, with consideration of the special conditions of the Contract in each case.

It will be deemed that all indirect costs, risk and profit are distributed among the rates and prices entered in the Schedule of Prices in proportion to the direct costs allowed for by the Contractor in each rate and price.

The location of the works shown on the Drawings may be varied. Each price, rate or sum entered in the Schedule of Prices covers the scope of work defined regardless of where the work is performed on the Site.

Provisional Items shall be treated as Provisional Sums for payment purposes and only expended with the approval of the Engineer.

If approved by the Engineer each Provisional Item or Sum is priced as a variation so that the application of the tendered rate to the actual quantity of work completed under the item (including nil work) provides full compensation to the Contractor.

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The Contractor shall, when required by the Engineer, produce all quotations, invoices, vouchers, time sheets and accounts or receipts in connection with expenditure in respect of Provisional Items or Sums.

1 Preliminary and General

1.1 Site establishment and Contractor's site facilities

This item includes for the Contractor's mobilisation, establishment on Site of all manpower, equipment, plant, vehicles, accommodation, temporary services, temporary drainage and fencing, and all overhead costs such as arise from mobilising resources and plant, the preparation and supply of the Site plans required by the Contract and the initial programme, the provision of all notifications and information required before commencing work on the Site and the like.

The lump sum to be certified will be assessed by the Engineer on receipt of the Contractor's first payment claim following work commencing on site.

1.2 Contract administration

This item, covers all administrative and ongoing overhead costs such as health & safety, Resource Consent compliance, site supervision, survey requirements (where not covered under a separate item), communications, bonds and insurances, permit costs and administration of the permits (where not covered under a separate item), financing costs, vehicles, head office backup, revision and upgrading of the programme of Works and the like during the Contract period (except items scheduled separately).

This item also includes for preparation, updating, and compliance with the Construction Management Plan (CMP) and all other Site plans referenced in the Specification unless specifically allowed for under a separate item, and obtaining approval from the relevant local authority and the Engineer for such plans.

The item also covers the maintenance of services for the running of the Site, and minor hand held items of plant and equipment. For the purposes of this clause, the Contract period shall finish at the earlier of the Due Date for Completion or Practical Completion.

The proportion of the lump sum to be certified from time to time, will be assessed by the Engineer in accordance with the stage of Contract completion.

1.3 Drawings (PROVISIONAL ITEM)

The item includes for Contractor prepared Drawings, where the Contractor prepares a design and build solution for temporary or permanent works.

100% of the lump sum will be certified after the Contractor prepared Drawings have been approved as suitable for construction by the Engineer.

1.4 Pre-construction Condition Survey

The item includes for completion of the specified pre-construction condition survey of surrounding infrastructure (road reserve, underground and overhead services), buildings and other structures to the extent shown on the Drawings or as otherwise required by the Contract.

100% of the lump sum will be certified after the pre-construction condition survey results have been provided to the Engineer.

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1.5 Condition surveys - CCTV Inspections of buried services (PROVISIONAL ITEM)

The item is related to undertaking condition surveys of buried stormwater and sewer services that may be affected by the works and covers the following:

- Pre-construction CCTV video to ascertain pipe condition to 10m either side of the property boundary or closest manhole.
- Post-construction CCTV video to ascertain pipe condition to 10m either side of the property boundary or closest manhole.

The item is a lump sum 50% payable on completion of the pre-construction CCTV video and 50% payable on completion of the post-construction CCTV video. This is a Provisional Item and is only to be expended at the Engineer's instruction.

1.6 Dust Control

The item includes for dust control in accordance with the Resource Consent conditions and to local council requirements.

The proportion of the lump sum to be certified from time to time, will be assessed by the Engineer in accordance with the stage of Contract completion.

1.7 Stormwater and Sediment Control

The item includes implementation, maintenance, and decommissioning of erosion and sediment control measures as required by the Resource Consent conditions, and any remediation that may be required due to inadequate performance of such measures.

50% of the lump sum will be certified once the control measures have been established, 25% once these have been removed and any remediation undertaken, with the balance certified once the Practical Completion Certificate has been issued.

1.8 Construction Noise (PROVISIONAL ITEM – delete if not required)

The item includes preparation of a Construction Noise Plan and implementation of noise monitoring and reporting, where required by the Resource Consent conditions.

50% of the lump sum will be certified once the Construction Noise Plan has been accepted by the Engineer, 25% on provision of the noise monitoring test results and 25% at Contract completion.

Where construction noise monitoring is required by the Engineer, or where any noise complaints are received from neighbours, this shall be treated as a variation to the contract.

1.9 Construction Vibrations (PROVISIONAL ITEM – delete if not required)

The item includes preparation of a Construction Vibration Plan when required by the Resource Consent conditions. The item also includes undertaking vibration monitoring and reporting where required by the Resource Consent conditions.

50% of the lump sum will be certified once the Construction Vibration Plan has been accepted by the Engineer, 25% on provision of the vibration monitoring test results and 25% at Contract completion. Where construction vibration monitoring is required by the Engineer, or where any vibration complaints are received from neighbours, this shall be treated as a variation to the contract.

1.10 Traffic Control

The item includes for the establishment, maintenance and dis-establishment of all traffic control to allow all construction vehicles, equipment, machinery and materials delivery vehicles to safely enter and exit the Site. The item also includes for the protection of any council infrastructure at the Site access point including grass berm, footpaths and below ground services and the repair and making good of any damage caused by the Works.

50% of the lump sum will be certified once the protection /traffic control measures have been established, 25% once these have been removed and any damage repaired, with the balance certified once the Practical Completion Certificate has been issued.

1.11 Temporary fencing, signage and security

This item includes for the supply, erection and removal of security fencing and signage as required by the Resource Consent conditions or as otherwise required to secure the Site.

50% of the lump sum will be certified once the fencing and signage has been established and the remainder once the fencing and signage has been removed.

1.12 Existing Services

This item includes for verifying the location of existing services on the site that do not require removal or modification as part of the works. The item also includes the protection of the services during the works.

75% of the lump sum will be certified once that services have been located and appropriate protection measures put in place. The remaining portion of the lump sum will be certified once the Practical Completion certificate has been issued.

1.13 Demobilisation and Reinstatement

The item includes for the Contractor's demobilisation and removal of all manpower, equipment, plant, vehicles, accommodation, temporary services and temporary drainage from the Site, all reinstatement and making good of all disturbed surfaces. Also included is the removal of all remaining debris and materials no longer required and not nominated to be retained by the Principal.

75% of the lump sum will be certified once the Site cleanup and disestablishment has been completed and the balance once the Practical Completion Certificate has been issued.

1.14 Setting-out of works on site, as-built survey and as-built Drawings

This Item includes for undertaking all setting-out, construction monitoring, preparation of as-built surveys in accordance with the Drawings and Specification, and to allow construction quantities to be determined.

The proportion of the lump sum to be certified from time to time, will be assessed by the Engineer in accordance with the Stage of Contract completion.

2 Testing

2.1 Laboratory and Unscheduled Testing (PROVISIONAL SUM)

This is a provisional sum for Laboratory and Fielding testing over and above what is required by the Specification, where specifically instructed by the Engineer. All normal testing as required by the Specification is to be allowed for under Ground Improvement Works.

The cost for additional testing shall be agreed with the Engineer prior to undertaking the additional testing and shall allow for establishment and disestablishment of rigs or other equipment, location set up, in-situ testing, taking samples, preparation of samples and delivering them to the laboratory, laboratory testing, reporting and any associated construction stand-by time.

Payment shall be as agreed for each additional test undertaken, payable on provision of the test results.

2.2 Cone Penetration Testing (PROVISIONAL SUM)

This is a provisional sum for Cone Penetration testing over and above what is required by the Specification, where specifically instructed by the Engineer. All normal testing as required by the Specification is to be allowed for under the Ground Improvement Works to determine the degree of improvement achieved.

The cost for additional testing shall be agreed with the Engineer prior to undertaking the additional testing and shall allow for establishment and disestablishment of rigs, location set up, in-situ testing, reporting and any associated construction stand-by time.

Payment shall be as agreed for each additional test undertaken, payable on provision of the test results.

2.3 Standard Penetration Testing (PROVISIONAL SUM)

This is a provisional sum for Standard Penetration Testing over and above what is required by the Specification, where specifically instructed by the Engineer. All normal testing as required by the Specification is to be allowed for under the Ground Improvement Works to determine the degree of improvement achieved.

The cost for additional testing shall be agreed with the Engineer prior to undertaking the additional testing and shall allow for establishment and disestablishment of rigs, location set up, in-situ testing, reporting and any associated construction stand-by time.

Payment shall be as agreed for each additional test undertaken, payable on provision of the test results.

2.4 Dynamic Probe Heavy Testing (PROVISIONAL SUM)

This is a provisional sum for Dynamic Probe Heavy Testing over and above what is required by the Specification, where specifically instructed by the Engineer. All normal testing as required by the Specification is to be allowed for under the Ground Improvement Works to determine the degree of improvement achieved.

The cost for additional testing shall be agreed with the Engineer prior to undertaking the additional testing and shall allow for establishment and disestablishment of rigs, location set up, in-situ testing, reporting and any associated construction stand-by time.

Payment shall be as agreed for each additional test undertaken, payable on provision of the test results.

3 Site Preparation Earthworks

3.1 Clear site of debris

The item includes for the stripping, removal from site and disposal at an appropriate landfill, of any debris or deleterious material from the site (excluding clean or contaminated topsoil). The rate shall allow for all handling and transportation costs (including any health and safety precautions required) and all landfill disposal fees.

This item will be measured in tonnes of material removed off site (to align with landfill weighbridge measurements).

3.2 Strip topsoil and stockpile

The item includes for the stripping and temporary stockpiling of topsoil at the Site. Any topsoil identified by the Site Management Plan as contaminated or potentially contaminated shall be stockpiled separately from clean topsoil. The rate shall include for any necessary relocating of the topsoil material stockpiles during the Contract to permit the ground treatment works to be completed.

This item will be measured in cubic metres of topsoil stripped up to the minimum offset beyond the treatment boundaries, measured in cut, based on the proposed ground improvement method.

3.3 Respreading topsoil from stockpile

The item includes re-spreading all clean topsoil stockpiled to an even depth, specified on the drawings or in the specification, across the full extent of the ground treatment boundaries, disturbed by earthworks.

The item will be measured in cubic metres of topsoil material respread, measured as solid fill.

3.4 Supply and Spread Topsoil (PROVISIONAL ITEM) – JS: what is the difference between a provisional item and provisional sum?

This provisional item is for the supply and spread of imported topsoil required to an even depth, specified on the drawings or in the specification, across the full extent of the ground treatment boundaries outside the limits of the proposed building footprint, disturbed by earthworks.

The item will be measured in cubic metres of topsoil imported and placed, measured as solid fill.

3.5 Disposal of topsoil off site

3.5.1 Disposal of clean topsoil off site (PROVISIONAL ITEM)

This item includes removal of clean topsoil stockpiled not respread on the site under item 3.4 above. The rate shall allow for all handling and transportation costs.

The item will be measured in tonnes of clean topsoil material removed from site (to align with landfill weighbridge measurements). This item is a Provisional Item and is only to be expended upon instruction by the Engineer.

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3.5.2 Disposal of contaminated topsoil off site (PROVISIONAL ITEM)

This item includes removal and disposal of all topsoil material identified as contaminated in the Site Management Plan to an appropriate landfill. The rate shall allow for all handling and transportation costs and all landfill disposal fees. The rate shall also allow for any health and safety precautions required over and above those required for handling clean material.

The item will be measured in tonnes of material removed off site (to align with landfill weighbridge measurements). This item is a Provisional Item and is only to be expended upon instruction by the Engineer.

Ground Improvement Works (Note: delete sections which do not apply as appropriate)

4 Densified Crust

4.1 Densified Crust Type G1a (Excavate & Recompact)

4.1.1 Excavate Soil and Stockpile

The item is for the excavation of material to 2.0m below the bottom of foundation formation level to an on-site stockpile. The rate includes for removal of all materials within this depth, including building foundations, services, concrete, timber etc. If necessary, the excavated material will be classified on site as clean or contaminated and stockpiled separately.

The rate also allows for:

- any benching or battering that is required.
- all material handling, stockpiling and moving of stockpiles that is required to allow the Works to be constructed prior to final placement of the material under item 4.1.4 below.

This item is measured in cubic metres of cut to 2.0m below the bottom of foundation formation level, measured off the Drawings and to 1.0m offset from the proposed building footprint, including cut batters where required, or as otherwise shown on the Drawings, or as instructed by the Engineer. Allowance for over excavation below the specified depth or beyond the lateral extent shown on the drawings is included in the rate and shall not be paid for as an additional measured volume unless it is agreed with the Engineer that it is unsuitable material and covered by Item 4.1.8.

4.1.2 Temporary excavation retention system

This item is for providing temporary active excavation support to the perimeter of the ground treatment area with suitable methods (such as sheet piles), as considered necessary by the Contractor and with agreement by the Engineer, to avoid ground movements and any damage to the surrounding infrastructure, buildings or structures. Battering or benching shall not be considered as active temporary support and shall be included in the rate under item 4.1.1.

The item is a lump sum 50% payable on completion of installation of the active temporary support and 50% payable on removal of the active temporary support.

4.1.3 Dewatering

This item is for Site dewatering to lower and control groundwater levels and hydrostatic pressure to permit excavation and construction of the ground improvement works. Dewatering operations shall be adequate to assure the integrity of the finished project and protect adjacent structures.

The lump sum will make full allowance for obtaining any necessary permits and furnishing all equipment, labour and materials to install, operate, maintain, and remove the dewatering system in accordance with all applicable regulations.

The proportion of the lump sum to be certified from time to time, will be assessed by the Engineer in accordance with the stage of Contract completion.

4.1.4 Uplift site-won soil from stockpile and recompact - Extra over Item 4.1.1

The item includes for the placement and compaction of site-won soil previously stockpiled on Site (under item 4.1.1. above) to construct the Densified Crust. The item shall include for all testing required.

This item is measured in cubic metres of solid fill uplifted from stockpile, placed and compacted to the depth of foundation formation level as measured off the Drawings to 1.0m offset from the proposed building footprint, including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below the depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

4.1.5 Supply new fill material - Extra over Item 4.1.4 (PROVISIONAL ITEM)

The item includes for the supply of fill used to construct the Densified Crust.

This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings and to 1.0m offset from the proposed building footprint, including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below the depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume. This is a Provisional Item and is only to be expended at the Engineer's instruction.

4.1.6 Supply and place geogrid reinforcement

This item includes the supply, placement and securing of geogrid reinforcement between layers of the compacted site-won or new fill material as shown on the Drawings or as instructed by the Engineer.

Payment will be made upon completion of placement of the geogrid reinforcement on the square metre area of total geogrid placed (any wrap and laps areas are allowed for in the rate and are not measured for payment).

4.1.7 Remove excess spoil and dispose off-site

The item includes for the excavation and removal to an approved off-site dump, all excess spoil from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of all excess spoil from Site.

4.1.8 Remove unsuitable material and dispose off-site (Provisional Item)

This is a provisional item for the excavation and removal to an approved off-site dump, all unsuitable material from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of all unsuitable material from Site. This is a provisional item and is only to be expended at the Engineer's instruction.

4.1.9 Dispose of excess clean site-won material off-site – Extra over Item 4.1.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of clean site-won material to an approved off-site dump, where it is not required for re-use on Site.

The item is an extra-over to item 4.1.1 and includes for:

- transportation costs
- any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of excess site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

4.1.10 Dispose contaminated site won material off site – Extra over Item 4.1.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of contaminated site-won material to an approved off-site dump.

The item is an extra-over to item 4.1.1 and includes for:

- safe handling practices
- transportation costs
- disposal charges at the approved dump site

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

4.2 Densified Crust Type G1d (Reinforced Gravel Raft)

4.2.1 Excavate soil and stockpile

The item is for the excavation and stockpiling of site won material to 1.2m below the foundation formation level. The rate includes for removal of all materials within this depth, including building foundations, services, concrete, timber etc. If necessary, the excavated material will be classified on site as clean or contaminated and stockpiled separately.

The rate shall also allow for:

- any benching or battering that is required.
- all material handling, stockpiling and moving of stockpiles that is required to allow the Works to be constructed prior to final placement of the material under item 4.2.6 below.

This item is measured in cubic metres of cut to 1.2m below the bottom of foundation formation level, measured off the Drawings to 1.0m offset from the proposed building footprint, including cut batters where required, as otherwise shown on the Drawings or as instructed by the Engineer. Allowance for over excavation below the specified depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume, unless it is agreed with the Engineer.

4.2.2 Temporary excavation retention system

This item is for providing temporary active excavation support to the perimeter of the ground treatment area with suitable methods (such as sheet piles), as considered necessary by the Contractor and with agreement by the Engineer, to avoid ground movements and any damage to the surrounding infrastructure, buildings or structures. Battering or benching shall not be considered as active temporary support and shall be included in the rate under item 4.2.1.

The item is a lump sum 50% payable on completion of installation of the active temporary support and 50% payable on removal of the active temporary support.

4.2.3 Dewatering

This item is for Site dewatering to lower and control groundwater levels and hydrostatic pressure to permit excavation and construction of the ground improvement works. Dewatering operations shall be adequate to assure the integrity of the finished project and protect adjacent structures.

The lump sum will make full allowance for obtaining any necessary permits and furnishing all equipment, labour, and materials to install, operate, maintain, and remove the dewatering system in accordance with all applicable regulations.

The proportion of the lump sum to be certified from time to time, will be assessed by the Engineer in accordance with the stage of Contract completion.

4.2.4 Supply, place & compact GAP40/GAP65 aggregate

This item is for the supply, placement and compaction of the GAP40/GAP65 aggregate required to form the Reinforced Gravel Raft as shown on the Drawings.

The rate allows for all wetting or drying, placement and levelling, compaction by machine or hand methods, test interruptions, providing samples, in-situ and laboratory testing, drainage protection and remedial Works after testing, as well as maintenance of the completed surface.

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This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings to 1.0m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

4.2.5 Supply and place geogrid reinforcement

This item includes the supply, placement and securing of geogrid reinforcement between layers of the compacted GAP40/GAP65 aggregate as shown on the Drawings or as instructed by the Engineer.

Payment will be made upon completion of placement of the geogrid reinforcement on the square metre area of total geogrid placed (any wrap and laps areas are allowed for in the rate and are not measured for payment).

4.2.6 Uplift site-won soil from stockpile and recompact - Extra over Item 4.2.1

The item includes for the placement and compaction of site-won soil previously stockpiled on Site (under item 4.2.1. above) to place site won soil above the Reinforced Gravel Raft and where required outside of the extents of the improved ground footprint, as shown on the Drawings or as instructed by the Engineer. The item shall include for all testing required.

This item is measured in cubic metres of solid fill from the foundation formation level to the base of the topsoil as measured off the Drawings, to 1.0m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

4.2.7 Supply new fill material - Extra over Item 4.2.6 (PROVISIONAL ITEM)

The item includes for the supply, placement and compaction of fill to place above the Reinforced Gravel Raft if instructed by the Engineer.

This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings and to 1.0m offset from the proposed building footprint, including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below the depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume. This is a Provisional Item and is only to be expended at the Engineer's instruction.

4.2.8 Remove excess spoil and dispose off-site

The item includes for the excavation and removal to an approved off-site dump, all excess spoil from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of all excess spoil from Site.

4.2.9 Remove unsuitable material and dispose off-site (PROVISIONAL ITEM)

This a provisional item for the excavation and removal to an approved off-site dump, all unsuitable material from Site. The rate includes for any disposal charges at the approved dump site.

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This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of all unsuitable material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

4.2.10 Dispose excess clean site-won material off-site – Extra over Item 4.2.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of clean site-won soil to an approved off-site dump, where it is not required for re-use on Site.

The item is an extra-over to item 4.2.1 and includes for:

- transportation costs
- any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of clean site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

4.2.11 Dispose contaminated site won material off site – Extra over Item 4.2.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of contaminated site-won material to an approved off-site dump.

The item is an extra-over to item 4.2.1 and includes for:

- safe handling practices
- transportation costs
- disposal charges at the approved dump site

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5 Stabilised Crust

5.1 Reinforced Cement Stabilised Crust (Ex-situ Mixing) Type G2a

5.1.1 Excavate soil to mixing plant

The item includes for the excavation of material to stockpile or directly to the mixing plant to allow mixing with cement under item 5.1.4 below. The rate shall include:

- any benching or battering that is required.
- all material handling, stockpiling and moving of stockpiles and mixing plant that is required to allow the Works to be constructed prior to final placement of the material under item 5.1.7 below.

This item is measured in cubic metres of cut to 1.2m below bottom of foundation formation level, measured off the Drawings to 1.5m offset from the proposed building footprint including cut batters where required, as otherwise shown on the Drawings or as instructed by the Engineer. Allowance for over excavation below the specified depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume unless it is agreed with the Engineer.

5.1.2 Temporary excavation retention system

This item is for providing temporary active excavation support to the perimeter of the ground treatment area with suitable methods (such as sheet piles), as considered necessary by the Contractor and with the agreement of the Engineer, to avoid ground movements and any damage to the surrounding infrastructure, buildings or structures. Battering or benching shall not be considered as active temporary support and shall be included in the rate under item 5.1.1.

The item is a lump sum 50% payable on completion of installation of the active temporary support and 50% payable on removal of the active temporary support.

5.1.3 Dewatering

This is a provisional item for Site dewatering to lower and control groundwater levels and hydrostatic pressure to permit excavation and construction of the ground improvement works. Dewatering operations shall be adequate to assure the integrity of the finished project and protect adjacent structures.

The lump sum will make full allowance for obtaining any necessary permits and furnishing all equipment, labour, and materials to install, operate, maintain, and remove the dewatering system in accordance with all applicable regulations.

The proportion of the lump sum to be certified from time to time, will be assessed by the Engineer in accordance with the stage of Contract completion.

5.1.4 Supply cement, mix ex-situ and re-compact back into the excavation

This item is for the supply of cement at the minimum dosage rate shown on the Drawings or as specified in the Contract, mixing the cement ex-situ into the soil excavated under item 5.1.1 above, placement of the cement/soil mixed material back into the excavation and compaction of the material to achieve the level of compaction required in the Specification. The item includes for suitable and safe storage of the cement on Site for the duration of the Works (if required) and all testing, including laboratory testing to verify cement dosing rate.

This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings to 1.0m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below the depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

5.1.5 Supply additional cement (at the rate of 1% of the dry soil mass or 14 kg/m³ minimum) and mix ex-situ (PROVISIONAL ITEM)

This provisional item is for the supply of additional cement at a dosage rate of 14kg/m³ (1% dry soil mass) over and above that required under item 5.1.4. This item shall also include for any additional re-mixing ex-situ into the material. The item includes for suitable and safe storage of the cement on Site for the duration of the Works (if required).

Payment is per cubic metre of additional ground treated, measured as solid volume in place. This item is provisional and shall only be expended upon instruction by the Engineer.

5.1.6 Supply and place geogrid reinforcement

This item includes the supply, placement and securing a minimum of one (1) layer of Geogrid Reinforcement or two (2) layers in areas of "major" lateral spread between layers of the compacted cement mixed material as specified on the Drawings or as instructed by the Engineer according to MBIE Repair & Rebuild Guidance Document Section 15.3 and Appendix C4.

Payment will be made upon completion of placement of the Geogrid Reinforcement on the square metre area of densified cement mixed material covered (wrap and laps areas are allowed for in the rate and are not measured for payment).

5.1.7 Uplift site-won soil from stockpile and recompact - Extra over Item 5.1.1

The item includes for the placement and compaction of site-won soil previously stockpiled on Site (under item 5.1.1. above) to place site won soil above the Cement Stabilised Crust and where required outside of the extents of the improved ground footprint, as shown on the Drawings or as instructed by the Engineer. The item shall include for all testing required.

This item is measured in cubic metres of solid fill from the foundation formation level to the base of the topsoil as measured off the Drawings, to 1.0m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

5.1.8 Remove excess spoil from Site

The item includes for the excavation and removal to an approved off-site dump, all excess spoil from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of excess spoil from Site.

5.1.9 Remove unsuitable material from Site (PROVISIONAL ITEM)

This is a provisional item for the excavation and removal to an approved off-site dump, all unsuitable material from Site. The rate includes for any disposal charges at the approved dump site.

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This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of unsuitable material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.1.10 Dispose excess clean site-won material off-site – Extra over Item 5.1.1 (PROVISIONAL ITEM)

The item includes for the removal and disposal of clean site-won soil to an approved off-site dump, where it is not required for re-use on Site.

The item is an extra-over to item 5.1.1 and includes for:

- transportation costs
- any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of clean site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.1.11 Dispose contaminated site won material off site – Extra over Item 5.1.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of contaminated site-won material to an approved off-site dump.

The item is an extra-over to item 5.1.1 and includes for:

- safe handling practices
- transportation costs
- disposal charges at the approved dump site

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.2 Unreinforced Cement Stabilised Crust (In-situ Mixing) Type G2b

5.2.1 Excavate soil to stockpile

The item includes for the excavation of material above the watertable to stockpile or directly to the mixing plant to allow mixing with cement under item 5.2.4 below. The rate shall include:

- any benching or battering that is required.
- all material handling, stockpiling and moving of stockpiles and mixing plant that is required to allow the Works to be constructed prior to final placement of the material under item 5.2.6 below.

This item is measured in cubic metres of cut to the ground water level, from the bottom of foundation formation level, measured off the Drawings to 1.5m offset from the proposed building footprint including cut batters where required, as otherwise shown on the Drawings or as instructed by the Engineer. Allowance for over excavation below the specified depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

5.2.2 Supply cement and mix in-situ

This item is for the supply of cement at the minimum dosage rate shown on the Drawings or as specified in the contract, and mixing the cement in-situ into the soil to the depth and extent shown on the Drawings or as instructed by the Engineer. The items includes for suitable and safe storage of the cement on Site for the duration of the Works (if required) and all testing including laboratory testing to verify cement dosing rate. Where a combination of lime/cement is proposed, this should be identified on the completed Schedule of Prices.

Payment is per cubic metre of treated ground, measured as solid volume in place.

5.2.3 Supply additional cement (at the rate of 1% of the dry soil mass or 14 kg/m³ minimum) and mix in-situ (PROVISIONAL ITEM)

This provisional item is for the supply of additional cement at a dosage rate of 14kg/m³ (1% dry weight) over and above that required under item 5.2.1. This item shall also include for any additional re-mixing in-situ into the material. The item includes for suitable and safe storage of the cement on Site for the duration of the Works (if required).

Payment is per cubic metre of ground treated, measured as solid volume in place, extra over the rate provided for 5.2.1 above. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.2.4 Supply cement, mix ex-situ and recompact above groundwater table (PROVISIONAL ITEM)

This item is to allow for the option to construct the portion of the cement stabilised raft which is located above the ground water table using an ex situ method.

This item is for the supply of cement at a minimum dosage rate shown on the Drawings on as specified in the Contract, mixing the cement ex-situ into the material excavated under item 5.2.1 above, replacement of the material above the groundwater table and compaction of the materials to achieve the Specification. The item includes for suitable and safe storage of the cement on Site for the duration of the Works (if required) and all testing including laboratory testing to verify cement dosing rate.

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This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings to 1.5m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.2.5 Supply additional cement (at the rate of 1% of the dry soil mass or 14 kg/m³ minimum) and mix ex-situ (PROVISIONAL ITEM)

This provisional item is for the supply of additional cement at a dosage rate of 14kg/m³ (1% dry weight) over and above that required under item 5.2.4. This item shall also include for any additional re-mixing ex-situ into the material. The item includes for suitable and safe storage of the cement on Site for the duration of the Works (if required).

Payment is per cubic metre of additional ground treated, measured as solid volume in place, extra over the rate provided for item 5.2.4 above. This item is provisional and shall only be expended upon instruction by the Engineer.

5.2.6 Uplift site-won soil from stockpile and recompact - Extra over Item 5.2.1

The item includes for the placement and compaction of site-won soil previously stockpiled on Site to place site won soil above the Cement Stabilised Crust and where required outside of the extents of the improved ground footprint, as shown on the Drawings or as instructed by the Engineer. The item shall include for all testing required.

This item is measured in cubic metres of solid fill from the foundation formation level to the base of the topsoil as measured off the Drawings to 1.5m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

5.2.7 Remove excess spoil and dispose off-site

The item includes for the excavation and removal to an approved off-site dump, all excess spoil from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of excess spoil from Site.

5.2.8 Remove unsuitable material from Site (PROVISIONAL ITEM)

This is a provisional item for the excavation and removal to an approved off-site dump, all unsuitable material from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of unsuitable material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.2.9 Dispose excess clean site-won material off-site – Extra over Item 5.2.1 (PROVISIONAL ITEM)

The item includes for the removal and disposal of clean site-won soil to an approved off-site dump, where it is not required for re-use on Site.

The item is an extra-over to item 5.2.1 and includes for:

- transportation costs
- any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of clean site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

5.2.10 Dispose contaminated site won material off site – Extra over Item 5.2.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of contaminated site-won material to an approved off-site dump.

The item is an extra-over to item 5.2.1 and includes for:

- safe handling practices
- transportation costs
- disposal charges at the approved dump site

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

6 Stone Columns Type G4 & G5a

6.1 Excavate soil and stockpile (PROVISIONAL ITEM)

The item is for the excavation and stockpiling of site won material to the levels or depths shown on the Drawings or as instructed by the Engineer. The rate includes for removal of all materials within this depth, including building foundations, services, concrete, timber etc. If necessary, the excavated material will be classified on site as clean or contaminated and stockpiled separately.

The rate shall also allow for:

- any benching or battering that is required.
- all material handling, stockpiling and moving of stockpiles that is required to allow the Works to be constructed prior to final placement of the material under item 6.6 below.

This item is measured in cubic metres of cut, measured off the Drawings to 1.0m offset from the proposed building footprint, including cut batters where required, as otherwise shown on the Drawings or as instructed by the Engineer. Allowance for over excavation below the specified depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume. This is a Provisional Item and is only to be expended at the Engineer's instruction.

6.2 Supply gravel material and construct stone column

This item is for the construction of the stone columns at the minimum replacement ratios as specified on the Drawings or in the Contract. The rate includes machine set-up(s), rigging, de-rigging, excavation; supply, delivery, stockpile and installation of imported graded aggregate; stockpiling of excess spoil material and disposal off-site.

Payment is per cubic metre of stone material installed in the ground, measured as solid volume in place.

6.3 Supply and install additional volume of stone column gravel to increase depth or area replacement ratio (ARR) of treatment (PROVISIONAL ITEM)

This provisional item is for the supply of gravel at a cubic metre (m³) volume rate over and above that required under item 6.2. Allowance for additional filling due to the surrounding insitu soil or modification of the specified depth is included in the rate and shall not be paid for as an additional measured volume, unless instructed by the Engineer.

Payment is per cubic metre of additional stone material installed in the ground, measured as solid volume in place, over and above item 6.2.

6.4 Excavate and recompact engineered fill

This item is for the excavation of existing surface material (after construction of the stone columns) to 0.3m (minimum) below the bottom of foundation formation level, mixing, placement and recompaction to construct a 0.3m thick layer of engineered fill.

The rate shall include for the following:

- any benching or excavation support that is required.
- all material handling, stockpiling and moving of stockpiles that is required.

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- all testing required

This item shall be measured in cubic metres of volume filled, measured off the Drawings to 1.5m offset from the proposed building footprint, as otherwise shown on the Drawings or as instructed by the Engineer.

6.5 Supply, place & compact well-graded aggregate

The intent of this item is to provide a high specification alternative to item 6.4 above.

This item is for the supply, placement and compaction of the well-graded aggregate required to form the drainage layer as shown on the Drawings.

The rates allow for all placement and levelling, compaction by machine or hand methods, test interruptions, providing samples, in-situ and laboratory testing, drainage protection and remedial Works after testing, as well as maintenance of the completed surface until contract completion (or issue of practical completion?).

This item is measured in cubic metres, solid volume in place, measured off the Drawings to 1.5m offset from the proposed building footprint, as otherwise shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below the specified depth or beyond the offset from the ground treatment boundary is included in the rate and shall not be paid for as an additional measured volume.

6.6 Uplift site-won soil from stockpile and recompact - Extra over Item 6.1

The item includes for the placement and compaction of site-won soil previously stockpiled on Site to place site won soil where required outside of the extents of the improved ground footprint, as shown on the Drawings or as instructed by the Engineer. The item shall include for all testing required.

This item is measured in cubic metres of solid fill from the foundation formation level to the base of the topsoil as measured off the Drawings to 1.5m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

6.7 Remove excess spoil and dispose off-site

The item includes for the excavation and removal to an approved off-site dump, all excess spoil from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal all excess spoil from Site.

6.8 Remove unsuitable material from Site (PROVISIONAL ITEM)

This is a provisional item for the excavation and removal to an approved off-site dump, all unsuitable material from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of unsuitable material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

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6.9 Dispose clean site-won material off-site – Extra over Item 6.1 (PROVISIONAL ITEM)

The item includes for the excavation and removal and disposal of clean site-won material to an approved off-site dump, where it is not required for re-use on Site.

The item is an extra-over to item 6.1 and includes for:

- transportation costs
- any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

6.10 Dispose contaminated site won material off site – Extra over Item 6.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of contaminated site-won material to an approved off-site dump.

The item is an extra-over to item 6.1 and includes for:

- safe handling practices
- transportation costs
- disposal charges at the approved dump site

This item will be measured in tonnes of cut soil (to align with weighbridge dockets) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

7 Driven Timber Poles Type G5b

7.1 Excavate soil and stockpile

The item is for the excavation and stockpiling of site won material to the levels or depths shown on the Drawings or as instructed by the Engineer. The rate includes for removal of all materials within this depth, including building foundations, services, concrete, timber etc. If necessary, the excavated material will be classified on site as clean or contaminated and stockpiled separately.

The rate shall also allow for:

- any benching or battering that is required.
- all material handling, stockpiling and moving of stockpiles that is required to allow the Works to be constructed prior to final placement of the material under item 7.4 below.

This item is measured in cubic metres of cut, measured off the Drawings to 1.0m offset from the proposed building footprint, including cut batters where required, as otherwise shown on the Drawings or as instructed by the Engineer. Allowance for over excavation below the specified depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

7.2 Supply and install H5 Timber Pole

This item is for the installation of driven timber piles to the minimum depth and to the spacing as shown on the Drawings. The rate includes pile supply, delivery and stockpile of timber piles; machine set-up(s), rigging, de-rigging; predrilling and pile setup; installation of timber pile, overdriving, installation and removal of hardfill working platforms as required.

Payment is per timber pole installed to the specified unit length.

7.3 Supply, place & compact GAP65 aggregate

This item is for the supply, placement and compaction of the GAP65 aggregate layer over the top of the piles to the specified depth and extent as shown on the Drawings, or as instructed by the Engineer.

The rates allow for all placement and levelling, compaction by machine or hand methods, test interruptions, providing samples, in-situ and laboratory testing, drainage protection and remedial Works after testing, as well as maintenance of the completed surface.

This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings to 2.0m offset from the proposed building footprint including backfilling of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

7.4 Uplift site-won soil from stockpile and recompact - Extra over Item 7.1

The item includes for the placement and compaction of site-won soil previously stockpiled on Site (under item 7.1 above) to construct the Driven Timber Pole Ground Treatment. The item shall include for all testing required.

This item is measured in cubic metres of solid fill to the depth of foundation formation level measured off the Drawings to 2.0m offset from the proposed building footprint including backfilling

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of temporary cut batters and fill above the foundation formation level beyond the house footprint, as shown on the Drawings or as instructed by the Engineer. Allowance for additional filling due to over excavation below a depth or beyond the lateral extent shown on the Drawings is included in the rate and shall not be paid for as an additional measured volume.

7.5 Remove excess spoil and dispose off-site

The item includes for the excavation and removal to an approved off-site dump, all excess spoil from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of all excess spoil from Site.

7.6 Remove unsuitable material from Site (PROVISIONAL ITEM)

This is a provisional item for the excavation and removal to an approved off-site dump, all unsuitable material from Site. The rate includes for any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of unsuitable material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

7.7 Dispose excess clean site-won material off-site – Extra over Item 7.1 (PROVISIONAL ITEM)

The item includes for the removal and disposal of clean site-won soil to an approved off-site dump, where it is not required for re-use on Site.

The item is an extra-over to item 7.1 and includes for:

- transportation costs
- any disposal charges at the approved dump site.

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of clean site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

7.8 Dispose contaminated site won material off site – Extra over Item 7.1 (PROVISIONAL ITEM)

The item includes for the handling, transportation and disposal of contaminated site-won material to an approved off-site dump.

The item is an extra-over to item 7.1 and includes for:

- safe handling practices
- transportation costs
- disposal charges at the approved dump site

This item will be measured in tonnes of cut soil (to align with weighbridge docket) on removal of contaminated site won material from Site. This is a Provisional Item and is only to be expended at the Engineer's instruction.

8 Project Specific Requirements

8.1 Compensation for Overheads & Loss of Profit for Extension of Time (Provisional Item)

This provisional item allows for compensation to the Contractor for time related on-site and off-site overheads and loss of profit incurred in relation to an extension of time where agreed to by the Engineer in accordance with the Contract.

Payment shall be per working day.

8.2 Unscheduled Obligations

This item(s) shall be nominated by the tenderer and covers all additional work not specified elsewhere in the Schedule of Prices or Method of Measurement for which the Tenderer deems that a separate price is required. The Tenderer shall provide a description of what is covered under this item/s, specify how the item shall be measured and provide a rate and estimate of the quantity (where appropriate) or lump sum in the Schedule of Prices.

9 Dayworks (Provisional Items)

The provisional items for plant, labour and miscellaneous items are rates at which payment will be made for on a dayworks basis on the instruction of the Engineer. Payment will be made in respect of the actual hours worked or time used.

The rates allow for taxes, pensions, training, travelling time, insurances, holiday pay, payment in respect of time loss due to inclement weather, executive superintendence, non-working foremen, the use and maintenance of all small tools not classified as plant, all establishment charges, profit, overheads, and any other payments which the Contractor may be required to make to the workmen under the relevant employment agreements. Plant operators are included for under the rates for Plant.

Full payments for working plant will only be for the actual hours worked. In the event that plant is brought to the Site on the written instructions of the Engineer and used only for Dayworks, the net cost of haulage to and from Site will be paid to the Contractor. Where such plant brought to the Site is retained on standby on the Engineer's instruction, a standby rate equal to 60% of the full rate (calculated as above) applicable for up to 8 hours on any Working Day, will be payable. The rates for plant are for use of the plant inclusive of all fuel and consumable stores, overhauls, repairs and replacements, and for haulage to and from the Site (except as stated above) and inclusive of operator.

The time necessarily spent in moving plant within the Site as a result of the Engineer's instruction to use it on Dayworks will be added to the actual hours worked, provided that no time spent in moving for purposes of maintenance, repair or refuelling will be added.

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APPENDIX 4. **EXAMPLE SCHEDULE OF PRICES**

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EXAMPLE SCHEDULE OF PRICES

Item No.	Item Description	Unit	No.	Unit Rate	Total
1	Preliminary and General				
1.1	Site establishment and Contractor's site facilities	LS			
1.2	Contract administration	LS			
1.3	Drawings (PROVISIONAL ITEM)	LS			XXXX
1.4	Pre-construction condition survey	LS			
1.5	Condition surveys - CCTV Inspections of buried services (PROVISIONAL ITEM)	LS			XXXX
1.6	Dust Control	LS			
1.7	Stormwater and Sediment Control	LS			
1.8	Construction Noise (PROVISIONAL ITEM - delete if not required)	LS			XXXX
1.9	Construction Vibrations (PROVISIONAL ITEM - delete if not required)	LS			XXXX
1.10	Traffic Control	LS			
1.11	Temporary fencing, signage and security	LS			
1.12	Existing Services	LS			
1.13	Demobilisation and Reinstatement	LS			
1.14	Setting-out of works on site, as-built survey and as-built Drawings	LS			
2	Testing				
2.1	Laboratory and Unscheduled Testing (PROVISIONAL SUM)	ea			XXXX
2.2	Cone Penetration Testing (PROVISIONAL SUM)	ea			XXXX
2.3	Standard Penetration Testing (PROVISIONAL SUM)	ea			XXXX
2.4	Dynamic Probe Heavy Testing (PROVISIONAL SUM)	ea			XXXX

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3	Site Preparation Earthworks (delete if included elsewhere)				
3.1	Clear site of debris	tonnes			
3.2	Strip topsoil and stockpile	m ³			
3.3	Respreading topsoil from stockpile	m ³			
3.4	Supply and Spread Topsoil (PROVISIONAL ITEM)	m ³			XXXX
3.5.1	Disposal of clean topsoil off site (PROVISIONAL ITEM)	tonnes			XXXX
3.5.2	Disposal of contaminated topsoil off site (PROVISIONAL ITEM)	tonnes			XXXX
Ground Improvement Works (Delete sections which do not apply as appropriate)					
4	Densified Crust				
4.1	Densified Crust Type G1a (Excavate & Recompact)				
4.1.1	Excavate Soil and Stockpile	m ³			
4.1.2	Temporary excavation retention system	LS			
4.1.3	Dewatering	LS			
4.1.4	Uplift site-won soil from stockpile and recompact - Extra over Item 4.1.1	m ³			
4.1.5	Supply new fill material - Extra over Item 4.1.4 (PROVISIONAL ITEM)	m ³			XXXX
4.1.6	Supply and place geogrid reinforcement	m ²			
4.1.7	Remove excess spoil and dispose off-site	tonnes			
4.1.8	Remove unsuitable material and dispose off-site (PROVISIONAL ITEM)	tonnes			XXXX
4.1.8	Dispose of excess clean site-won material off site - Extra over Item 4.1.1 (PROVISIONAL ITEM)	tonnes			XXXX
4.1.9	Dispose contaminated site-won material off-site – Extra over Item 4.1.1 (PROVISIONAL ITEM)	tonnes			XXXX
4.2	Densified Crust Type G1d (Reinforced Gravel Raft)				
4.2.1	Excavate soil and stockpile	m ³			
4.2.2	Temporary excavation retention system	LS			

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4.2.3	Dewatering	LS			
4.2.4	Supply, place & compact GAP40/GAP65 aggregate	m ³			
4.2.5	Supply and place geogrid reinforcement	m ²			
4.2.6	Uplift site-won soil from stockpile and recompact - Extra over Item 4.2.1	m ³			
4.2.7	Supply new fill material - Extra over Item 4.2.6 (PROVISIONAL ITEM)	m ³			XXXX
4.2.8	Remove excess spoil and dispose off –site	tonnes			
4.2.9	Remove unsuitable material and dispose off -site (PROVISIONAL ITEM)	tonnes			XXXX
4.2.10	Dispose excess clean site-won material off site - Extra over Item 4.2.1 (PROVISIONAL ITEM)	tonnes			XXXX
4.2.11	Dispose excess contaminated site-won material off-site - Extra over Item 4.2.1 (PROVISIONAL ITEM)	tonnes			XXXX
5	Stabilised Crust				
5.1	Reinforced Cement Stabilised Crust (Ex-situ Mixing) Type G2a				
5.1.1	Excavate soil to mixing plant	m ³			
5.1.2	Temporary excavation retention system	LS			
5.1.3	Dewatering	LS			
5.1.4	Supply cement, mix ex-situ and recompact back into the excavation	m ³			
5.1.5	Supply additional cement (at the rate of 1% of the dry soil mass or 14 kg/m ³ minimum) and mix in-situ (PROVISIONAL ITEM)	m ³			XXXX
5.1.6	Supply and place geogrid reinforcement	m ²			
5.1.7	Uplift site-won soil from stockpile and recompact - Extra over Item 5.1.1	m ³			
5.1.8	Remove excess spoil from Site	tonnes			
5.1.9	Remove unsuitable material from Site (PROVISIONAL ITEM)	tonnes			XXXX
5.1.10	Dispose excess clean site-won material off-site – Extra over Item 5.1.1 (PROVISIONAL ITEM)	tonnes			XXXX
5.1.11	Dispose contaminated site-won material off-site – Extra over Item 5.1.1 (PROVISIONAL ITEM)	tonnes			XXXX

DATE: MAY 2016 VERSION: 1

MODULE 5A: APPENDICES 3, 4 & 5: TO ACCOMPANY SPECIFICATION OF GROUND IMPROVEMENT FOR RESIDENTIAL PROPERTIES IN THE CANTERBURY REGION

PAGE 35

5.2	Unreinforced Cement Stabilised Crust (In-situ Mixing) Type G2b				
5.2.1	Excavate soil to stockpile	m ³			
5.2.2	Supply cement and mix in-situ	m ³			
5.2.3	Supply additional cement (at the rate of 1% of the dry soil mass or 14 kg/m ³ minimum) and mix in-situ (PROVISIONAL ITEM)	m ³			XXXX
5.2.4	Supply cement, mix ex-situ and recompact above groundwater table (PROVISIONAL ITEM)	m ³			XXXX
5.2.5	Supply additional cement (at the rate of 1% of the dry soil mass or 14 kg/m ³ minimum) and mix in-situ (PROVISIONAL ITEM)	m ³			XXXX
5.2.6	Uplift site-won soil from stockpile and recompact - Extra over Item 5.2.1	m ³			
5.2.7	Remove excess spoil and dispose off-site	tonnes			
5.2.8	Remove unsuitable material and dispose off-site (PROVISIONAL ITEM)	tonnes			XXXX
5.2.9	Dispose excess clean site-won material off-site – Extra over Item 5.2.1 (PROVISIONAL ITEM)	tonnes			XXXX
5.2.10	Dispose contaminated site-won material off-site – Extra over Item 5.2.1 (PROVISIONAL ITEM)	tonnes			XXXX
6	Stone Columns Type G4 & G5a				
6.1	Excavate soil and stockpile (PROVISIONAL ITEM)	m ³			XXXX
6.2	Supply gravel material and construct stone column	m ³			
6.3	Supply and install additional volume of stone column gravel to increase depth or area replacement ratio (ARR) of treatment (PROVISIONAL ITEM)	m ³			XXXX
6.4	Excavate and recompact engineered fill	m ³			
6.5	Supply, place & compact well-graded aggregate	m ³			
6.6	Uplift site-won soil from stockpile and recompact - Extra over Item 6.1	m ³			
6.7	Remove excess spoil and dispose off-site	tonnes			
6.8	Remove unstable material and dispose off-site (PROVISIONAL ITEM)	tonnes			XXXX
6.9	Dispose clean site-won material off-site – Extra over Item 6.1 (PROVISIONAL ITEM)	tonnes			XXXX

DATE: MAY 2016 VERSION: 1

MODULE 5A: APPENDICES 3, 4 & 5: TO ACCOMPANY SPECIFICATION OF GROUND IMPROVEMENT FOR RESIDENTIAL PROPERTIES IN THE CANTERBURY REGION

PAGE 36

6.10	Dispose contaminated site-won material off-site – Extra over Item 6.1 (PROVISIONAL ITEM)	tonnes			XXXX
7	Driven Timber Poles Type G5b				
7.1	Excavate soil and stockpile	m ³			
7.2	Supply and install H5 Timber Pole	No.			
7.3	Supply, place & compact GAP65 aggregate	m ³			
7.4	Uplift site-won soil from stockpile and recompact - Extra over Item 7.1	LS			
7.5	Remove excess spoil and dispose off-site	tonnes			
7.6	Remove unsuitable material and dispose off-site (PROVISIONAL ITEM)	tonnes			XXXX
7.7	Dispose excess clean site-won material off-site – Extra over Item 7.1 (PROVISIONAL ITEM)	tonnes			XXXX
7.8	Dispose contaminated site-won material off-site – Extra over Item 7.1 (PROVISIONAL ITEM)	tonnes			XXXX
8	Project Specific Requirements				
8.1	Compensation for Overheads & Loss of Profit for Extension of Time (Provisional Item)	day			rate only
8.2	Unscheduled obligations				
8.X					
9	Dayworks (Provisional Items)				
9.1	Plant	hr			rate only
9.2	Labour	hr			rate only
9.3	Miscellaneous items	hr			
10	Total				
	Total price				

DATE: MAY 2016 VERSION: 1

MODULE 5A: APPENDICES 3, 4 & 5: TO ACCOMPANY SPECIFICATION OF GROUND IMPROVEMENT FOR RESIDENTIAL PROPERTIES IN THE CANTERBURY REGION

PAGE 37

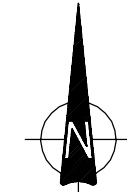
DATE: MAY 2016 **VERSION:** 1

MODULE 5A: APPENDICES 3, 4 & 5: TO ACCOMPANY SPECIFICATION OF GROUND
IMPROVEMENT FOR RESIDENTIAL PROPERTIES IN THE CANTERBURY REGION

PAGE 38

APPENDIX 5. **EXAMPLE DRAWINGS**

EXAMPLE DRAWING SET PROPOSED GROUND IMPROVEMENT WORKS 1 CHRISTCHURCH STREET, CHRISTCHURCH Preliminary Draft



- NOTES :
1. Prepared to accompany Repair & Rebuild Guidance Section 15.3 and approx. C4 and to promote the use of ground improvement.
 2. Drawings will be made available on MBIE website (www.building.govt.nz) in DWG format.
 3. All dimensions are in millimetres unless noted otherwise.

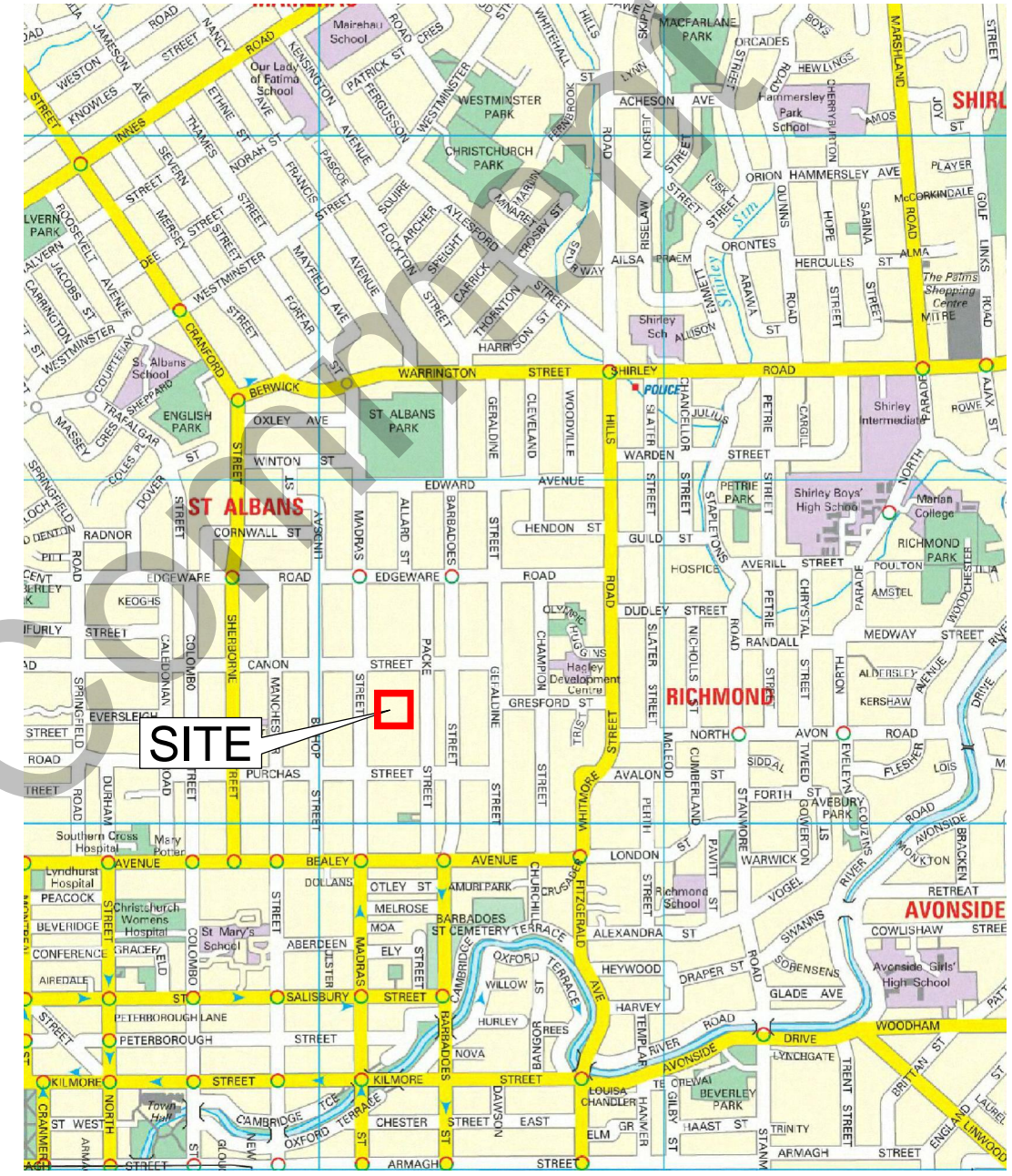


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EXAMPLE LOCALITY PLAN
SCALE 1:20,000

DRAWING No.	Rev	Title	Date Issued
General			
12345-01	1	Drawing List & Location Plan	1/1/2015
12345-02	1	Site Plan Extent of Ground Improvement Works	1/1/2015
12345-03	1	Existing Services Plan	1/1/2015
12345-04	1	Densified Crust Type G1a (Excavate & Recompact) Typical Detail	1/1/2015
12345-05	1	Densified Crust Type G1d (Reinforced Gravel Raft) Typical Detail	1/1/2015
12345-06	1	Reinforced Cement Stabilised Crust (Ex-Situ Mixing) Type G2a Typical Detail	1/1/2015
12345-07	1	Unreinforced Cement Stabilised Crust (In-situ Mixing) Type G2b Typical Detail	1/1/2015
12345-08	1	Stone Columns Type G4 & G5a Typical Details	1/1/2015
12345-09	1	Driven Timber Poles Type G5b Typical Details	1/1/2015

Draft for

1	First Issue		
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CADFILE : \\12345-01.dwg			
APPROVED : NOT FOR CONSTRUCTION			
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EXAMPLE DRAWING SET PROPOSED GROUND IMPROVEMENT WORKS

1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

Drawing List &
Location Plan



SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-01	REV. 1
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DRAWING STATUS: PRELIMINARY DRAFT

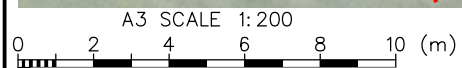
TABLE 1.

SETOUT COORDINATES FOR EXTENT OF GROUND IMPROVEMENT WORKS

Point	Coordinates	
1	808500.74 mN	393447.76 mE
2	808502.91 mN	393447.75 mE
3	808504.33 mN	393445.27 mE
4	808506.49 mN	393445.28 mE

NOTES :

- All dimensions are in millimetres unless noted otherwise.
- Coordinate Datum: NZ Geodetic Datum, Mt Pleasant 2000 circuit.
- Level Datum: Christchurch City Datum 2012.
- Sediment control measures to comply with Resource Consent conditions.
- Construction noise and vibration limits shall comply with latest "For Construction" version of the Contract Specification.
- Existing dwelling, garage and all foundations / hardstand areas to be removed by others prior to commencing construction of the ground improvement works.
- This drawing shall be read in conjunction with the Contract Specification.



LEGEND	
	Extent of Ground Treatment, Type G1 & G2a
	Extent of Ground Treatment, Type G2b & G4
	Extent of Ground Treatment, Type G5
	Site Boundary
	Proposed Building Footprint
	Minimum Extent of Pre-construction Building Condition Survey
	Setout Point for Minimum Extent of Ground Improvement Works. Refer to Table 1 for Coordinates.
	Existing Contour (1.0m intervals)
	Existing Contour (0.2m intervals)

Engineer to show as appropriate

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1	First Issue		
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EXAMPLE DRAWING SET PROPOSED GROUND IMPROVEMENT WORKS

1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

Site Plan
Extent of Ground Improvement Works

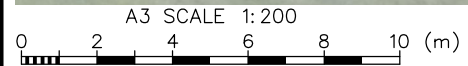
SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-02	REV. 1
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LEGEND	
	Site Boundary
	Existing Sanitary Sewer
	Existing Stormwater
	Existing Watermain
	Existing Underground Power
	Existing Telecom
	Existing Fence
	Existing Retaining Structure
	Above ground power pole
	Existing Trees

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- NOTES :
- All dimensions are in millimetres unless noted otherwise.
 - Coordinate Datum: NZ Geodetic Datum, Mt Pleasant 2000 circuit.
 - Level Datum: Christchurch City Datum 2012.
 - Survey provided by Wally and Associates
 - All service locations are approximate only and further services may be present on site which are not shown on this drawing.
 - Existing dwelling, garage, shed and all foundations / hardstand areas will be removed by others prior to possession of the site for the ground improvement works.
 - The ground improvement Contractor shall confirm the on-site location of all services and protect or make safe all such services prior to mobilising any heavy equipment to site.
 - This drawing shall be read in conjunction with the Contract Specification.

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EXAMPLE DRAWING SET
PROPOSED GROUND
IMPROVEMENT WORKS

1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

Existing Services
Plan

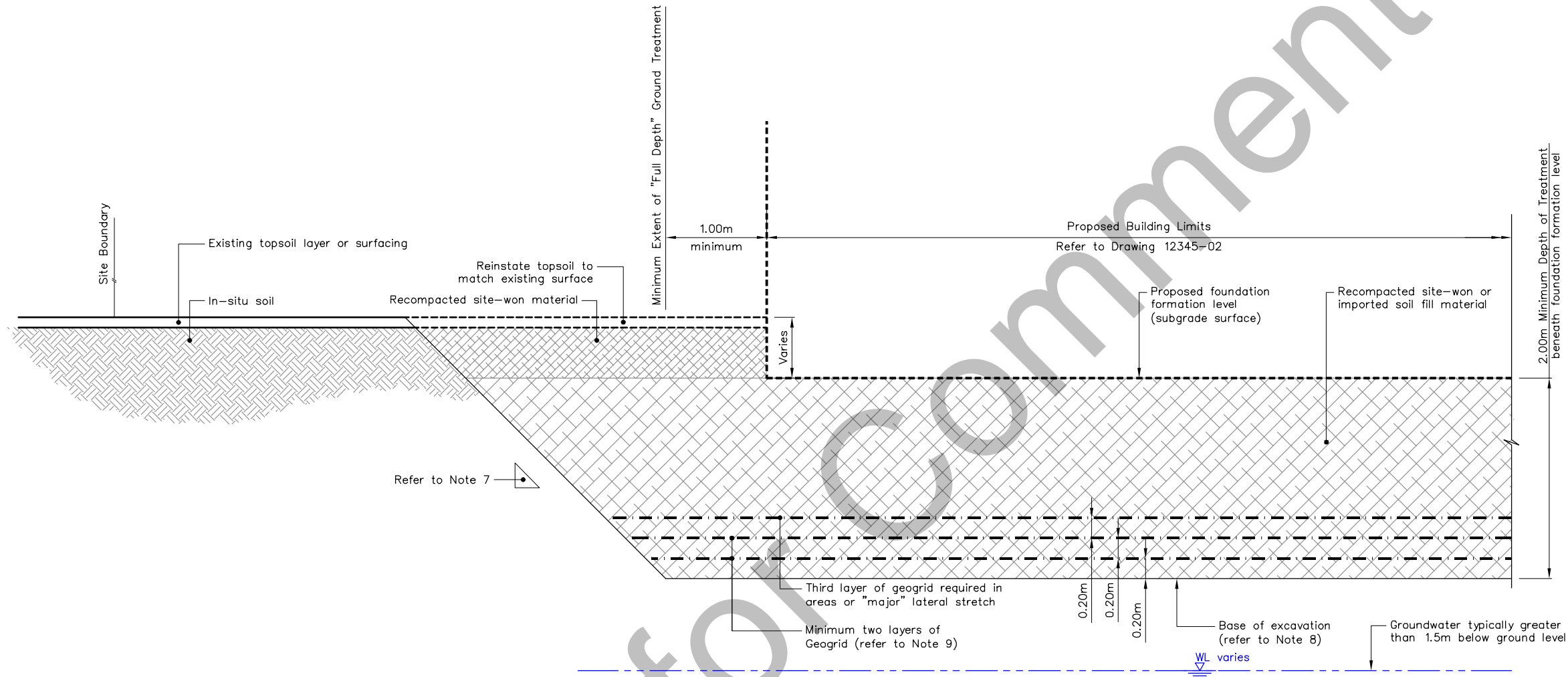
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SCALES (AT A3 SIZE)
AS SHOWN

DWG. No. 12345-03

REV. 1





SECTION X TYPE G1a (EXCAVATE & RECOMPACT) GROUND IMPROVEMENT WORKS
SCALE 1:50 (02) (2.0m deep treatment)

- NOTES :
1. All dimensions are in millimetres unless noted otherwise.
 2. Testing of the raft shall be completed as detailed in the Contract Specification.
 3. All levels are relative to the Christchurch City Datum 2012.
 4. The contractor shall install erosion and sediment control measures as required to comply with the Resource Consent conditions.
 5. Construction noise and vibration levels shall comply with latest "For Construction" version of the Contract Specification.
 6. This drawing shall be read in conjunction with the Contract Specification.
 7. The Contractor is responsible for the design of all temporary works, in particular the design of any batter slopes, dewatering systems and/or retention systems that are required to ensure stability of ground is maintained at all times during the construction of the Ground Improvement Works.

Notes Continued

1	First Issue		
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EXAMPLE DRAWING SET
PROPOSED GROUND
IMPROVEMENT WORKS

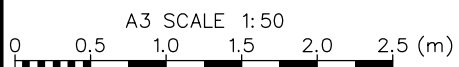
1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

Shallow Densified Crust
Type G1a
(Excavate & Recompact)
Typical Details

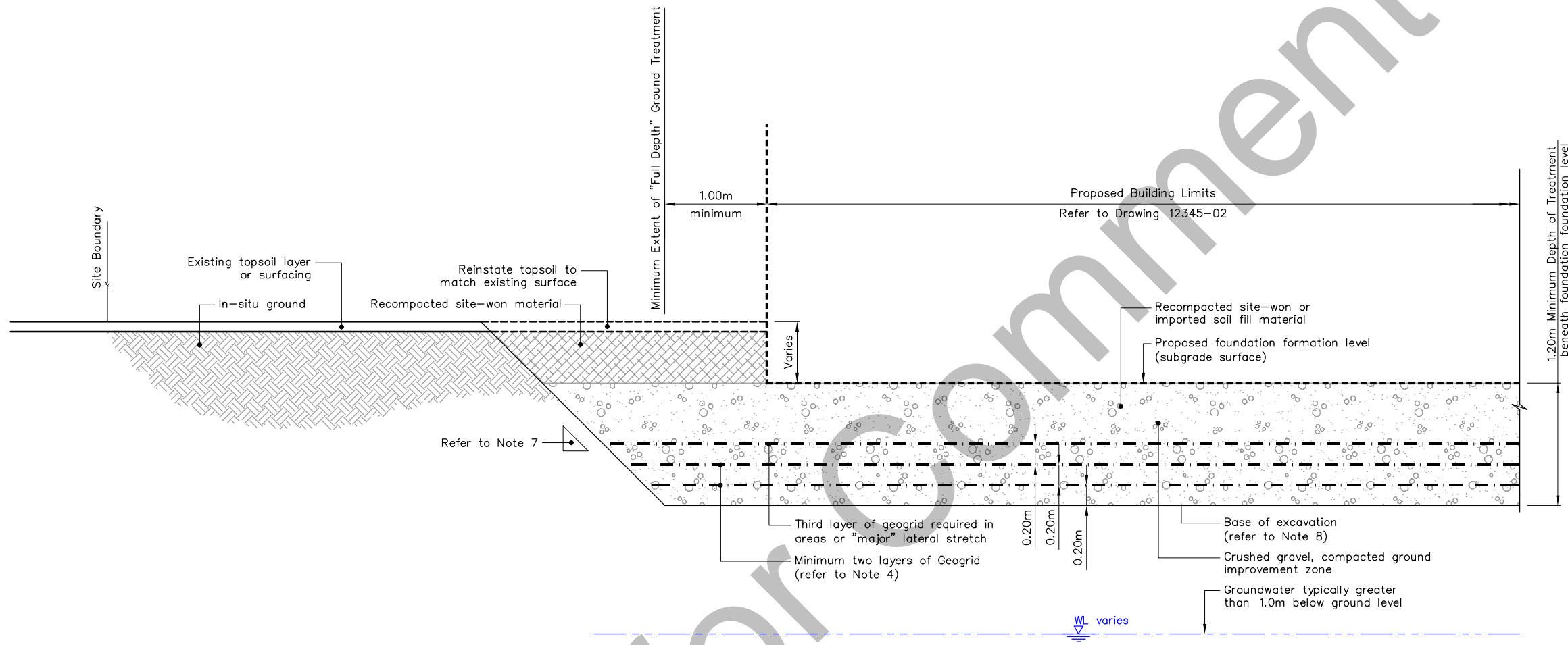
SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-04	REV. 1
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NOTES CONT:

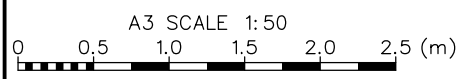
8. Base excavation to be inspected by the Engineer. The base of the excavation is to be stable (not yielding) prior to backfilling. Engineer to advise on any additional improvement measures required prior to backfill placement. Where the base of the excavation is stable the excavation may be terminated at 1.8m depth and lower 200mm compacted insitu. Where the base of the excavation is not stable the lower 200mm maybe able to be stabilised using cement. Alternatively the base of the excavation may need to be undercut, a non-woven geotextile fabric (Bidim A19 or approved equivalent) placed along with a compacted rock or crushed concrete to create a 'working platform' to allow the ground improvement above to be constructed.
9. Geogrid to be specified by the Design Engineer according to MBIE Repair & Rebuild Guidance Document Section 15.3 and Appendix C4



DRAWING STATUS: PRELIMINARY DRAFT



SECTION X TYPE G1d (REINFORCED CRUSHED GRAVEL RAFT) GROUND IMPROVEMENT WORKS
SCALE 1:50 (02) (1.2m deep treatment)



- NOTES :
- All dimensions are in millimetres unless noted otherwise.
 - Testing of the raft shall be completed as detailed in the Contract Specification.
 - All levels are relative to the Christchurch City Datum 2012.
 - The contractor shall install erosion and sediment control measures as required to comply with the Resource Consent conditions.
 - Construction noise and vibration levels shall comply with latest "For Construction" version of the Contract Specification.
 - This drawing shall be read in conjunction with the Contract Specification.
 - The Contractor is responsible for the design of all temporary works, in particular the design of any batter slopes, dewatering systems and/or retention systems that are required to ensure stability of ground is maintained at all times during the construction of the Ground Improvement Works.
- Notes Continued

1	First Issue		
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EXAMPLE DRAWING SET
PROPOSED GROUND IMPROVEMENT WORKS

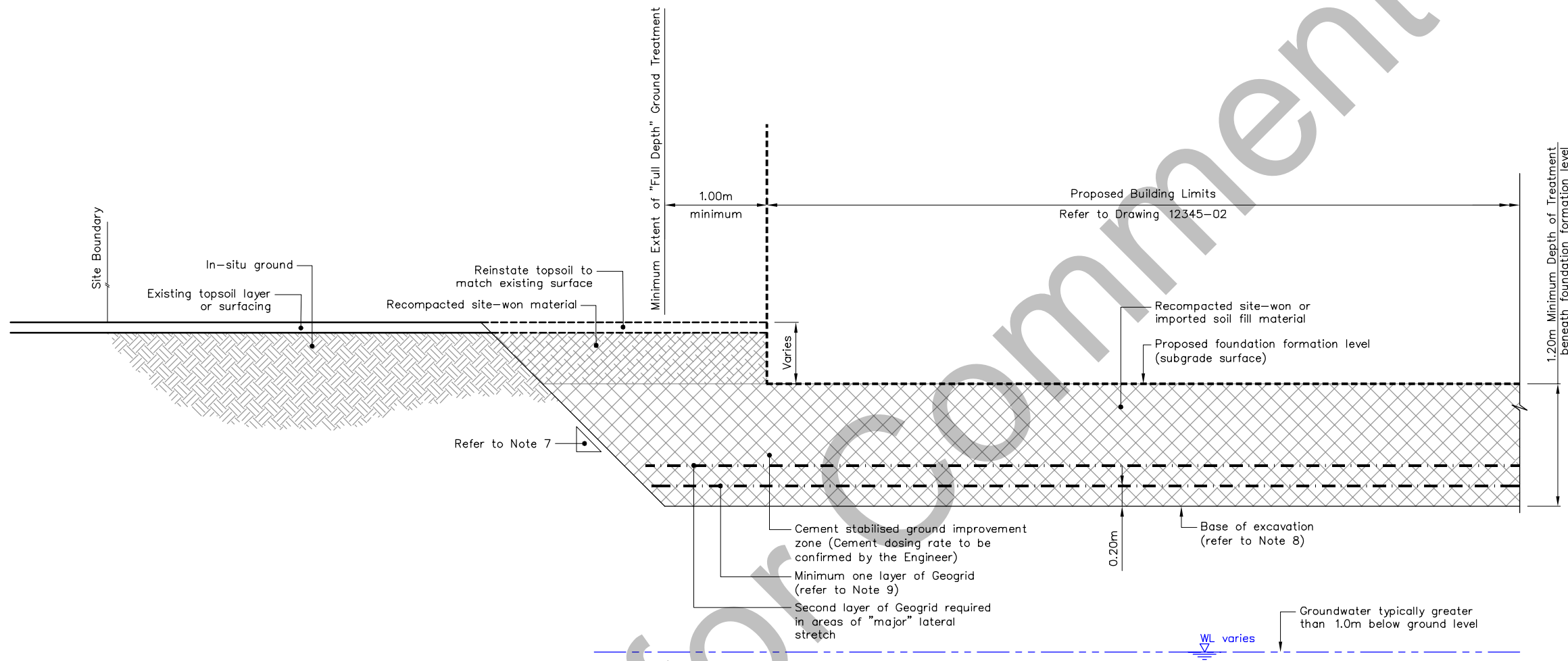
1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

Shallow Densified Crust
Type G1d (Reinforced
Crushed Gravel Raft)
Typical Details

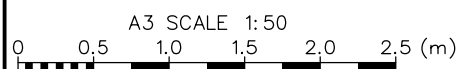
DRAWING STATUS: PRELIMINARY DRAFT

SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-05	REV. 1
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- NOTES CONT:
- Base excavation to be inspected by the Engineer. The base of the excavation is to be stable (not yielding) prior to backfilling. Engineer to advise on any additional improvement measures required prior to backfill placement. Where the base of the excavation is stable the excavation may be terminated at 1.8m depth and lower 200mm compacted insitu. Where the base of the excavation is not stable the lower 200mm maybe able to be stabilised using cement. Alternatively the base of the excavation may need to be undercut, a non-woven geotextile fabric (Bidim A19 or approved equivalent) placed along with a compacted rock or crushed concrete to create a 'working platform' to allow the ground improvement above to be constructed.
 - Geogrid to be specified by the Design Engineer according to MBIE Repair & Rebuild Guidance Document Section 15.3 and Appendix C4



SECTION X TYPE G2a (EXCAVATE, MIX & REPLACE) GROUND IMPROVEMENT WORKS
SCALE 1:50 (02) (1.2m deep treatment)



- NOTES :
- All dimensions are in millimetres unless noted otherwise.
 - Testing of the raft shall be completed as detailed in the Contract Specification.
 - All levels are relative to the Christchurch City Datum 2012.
 - The contractor shall install erosion and sediment control measures as required to comply with the Resource Consent conditions.
 - Construction noise and vibration levels shall comply with latest "For Construction" version of the Contract Specification.
 - This drawing shall be read in conjunction with the Contract Specification.
 - The Contractor is responsible for the design of all temporary works, in particular the design of any batter slopes, dewatering systems and/or retention systems that are required to ensure stability of ground is maintained at all times during the construction of the Ground Improvement Works.
- Notes Continued

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EXAMPLE DRAWING SET
 PROPOSED GROUND
 IMPROVEMENT WORKS

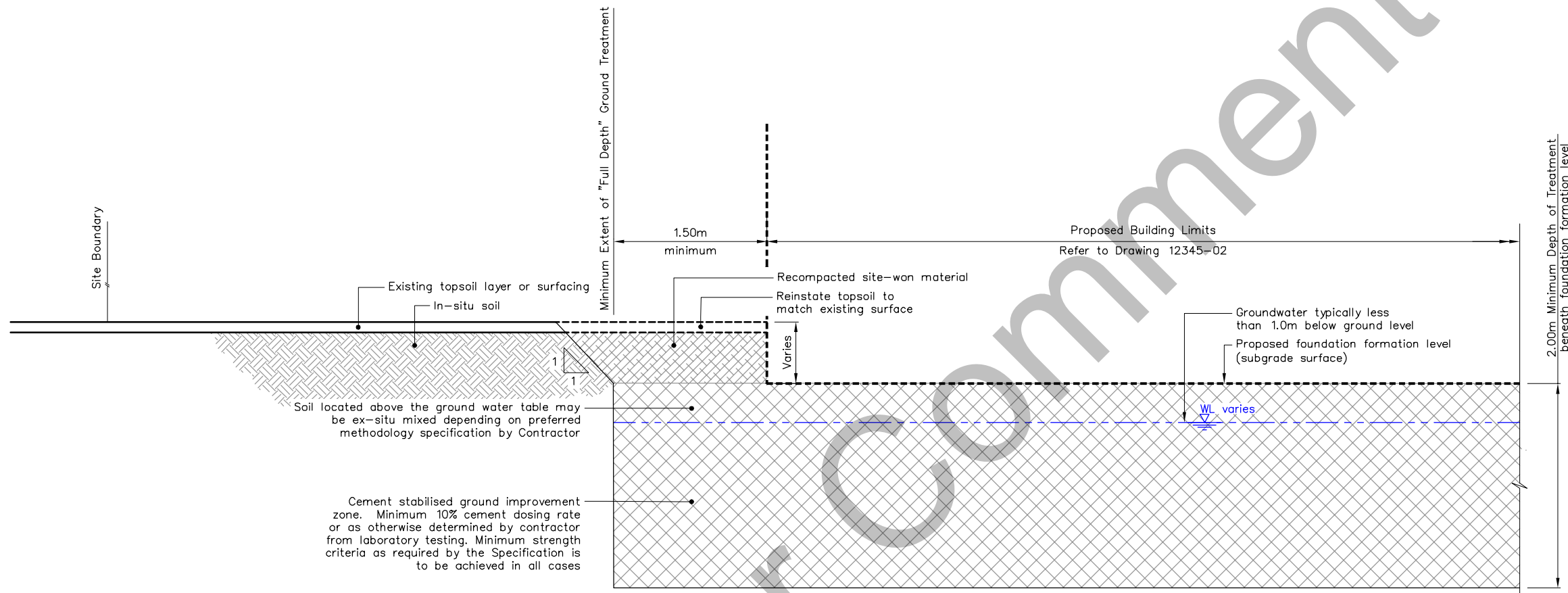
1 CHRISTCHURCH ROAD
 CHRISTCHURCH
 CANTERBURY

Shallow Cement Stabilised
 Crust (Excavate, Mix &
 Replace) Type G2a
 Typical Details

DRAWING STATUS: PRELIMINARY DRAFT

SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-06	REV. 1
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- NOTES CONT:
- Base excavation to be inspected by the Engineer. The base of the excavation is to be stable (not yielding) prior to backfilling. Engineer to advise on any additional improvement measures required prior to backfill placement. Where the base of the excavation is stable the excavation may be terminated at 1.8m depth and lower 200mm compacted insitu. Where the base of the excavation is not stable the lower 200mm maybe able to be stabilised using cement. Alternatively the base of the excavation may need to be undercut, a non-woven geotextile fabric (Bidim A19 or approved equivalent) placed along with a compacted rock or crushed concrete to create a 'working platform' to allow the ground improvement above to be constructed.
 - Geogrid to be specified by the Design Engineer according to MBIE Repair & Rebuild Guidance Document Section 15.3 and Appendix C4



Draft for Comment

SECTION X TYPE G2b (CEMENT STABILISED CRUST, IN-SITU MIXED)
 SCALE 1:50 (02) (2.0m deep treatment)

- NOTES :
1. All dimensions are in millimetres unless noted otherwise.
 2. Testing of the raft shall be completed as detailed in the Contract Specification.
 3. All levels are relative to the Christchurch City Datum 2012.
 4. Erosion and sediment control measures to comply with Resource Consent conditions.
 5. Construction noise and vibration limits shall comply with latest "For Construction" version of Contract Specification.
 6. This drawing shall be read in conjunction with the Contract Specification.

1	First Issue	
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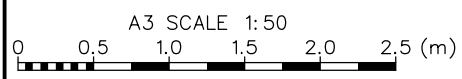
EXAMPLE DRAWING SET
 PROPOSED GROUND
 IMPROVEMENT WORKS

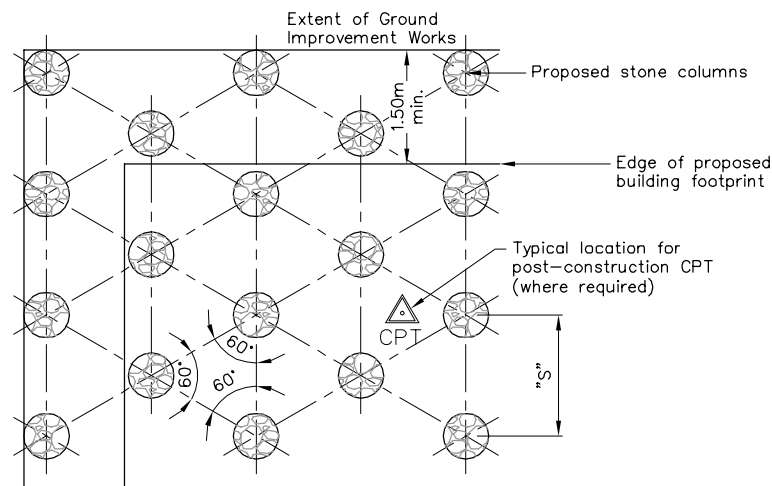
1 CHRISTCHURCH ROAD
 CHRISTCHURCH
 CANTERBURY

Unreinforced Cement
 Stabilised Crust
 (In-Situ Mixing) Type G2b
 Typical Details

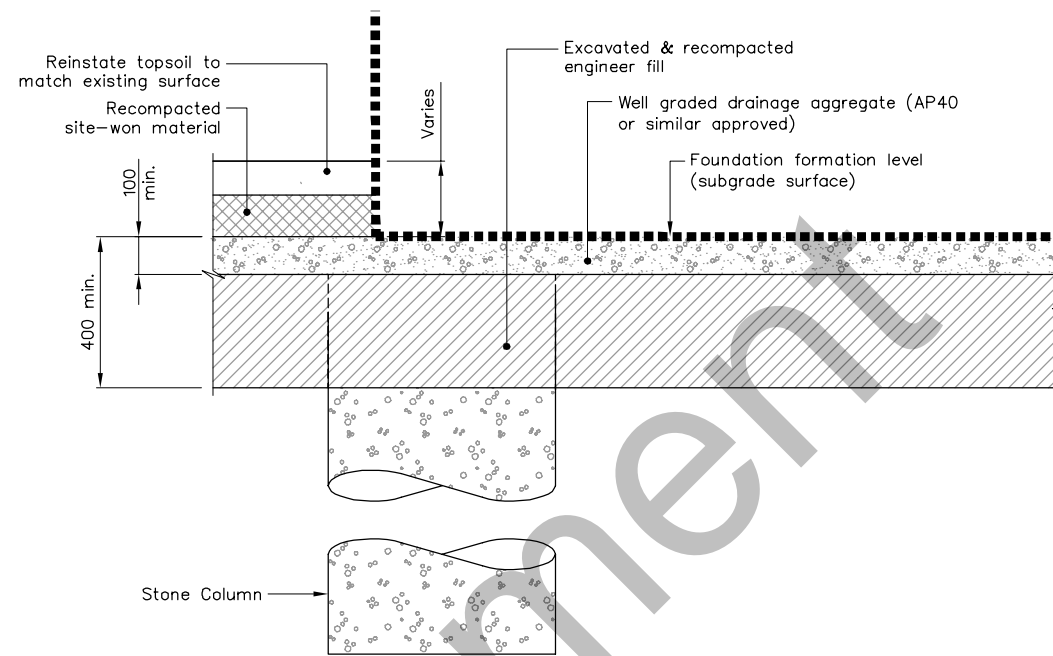
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SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-07	REV. 1
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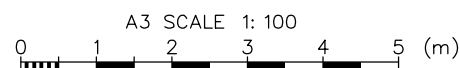
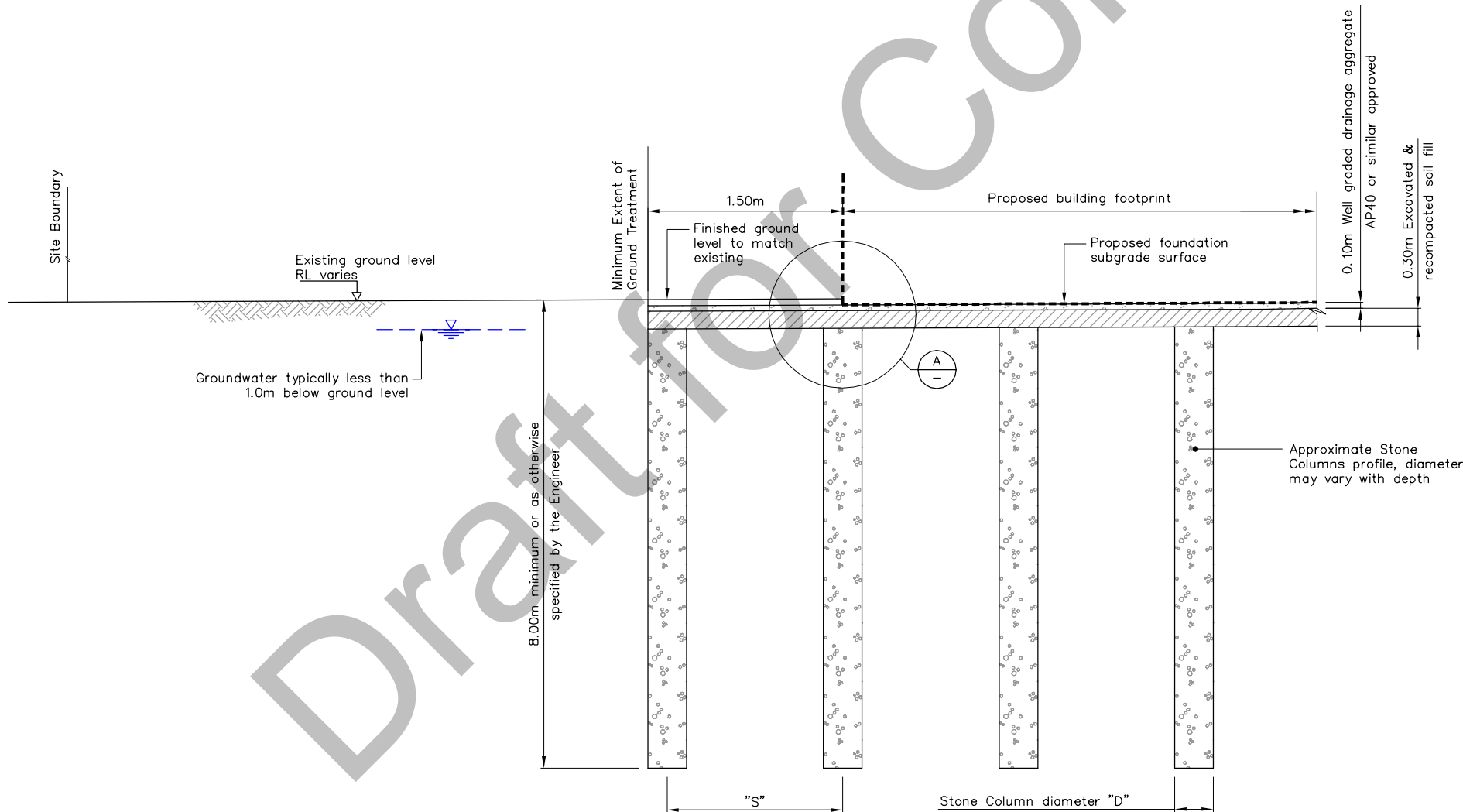




PLAN OF TYPICAL STONE COLUMN TRIANGULAR LAYOUT
SCALE 1: 100



DETAIL A TOP OF STONE COLUMN
SCALE 1:20



STONE COLUMN INSTALLATION
TYPICAL SECTION
SCALE 1: 100

- NOTES :
- All dimensions are in millimetres unless noted otherwise.
 - Construction trials are to be undertaken in collaboration with the Engineer, to confirm the optimum construction methodology and column configuration.
 - All levels are in terms of Christchurch City Datum 2012.
 - Minimum Area Replacement Ratio, ARR, shall be <inserted by Design Engineer>. Average stone column diameter and spacing "S" to be proposed by the contractor and approved by the Engineer.
 - The ARR = $c1 (D/S)^2$, where $c1 = \pi/4$, for square layout and $c1 = \pi(2/\sqrt{3})$ for triangular layout D= Average Diameter, S= Spacing.
 - This drawing should be read in conjunction with the Contract Specifications.
 - <Optional Note> CPT degree of improvement testing to be undertaken. Minimum CPT resistance shall be <inserted by Design Engineer>. Refer to Specification for post-improvement CPT requirements. OR CPT degree of improvement testing is not required.

1	First Issue		
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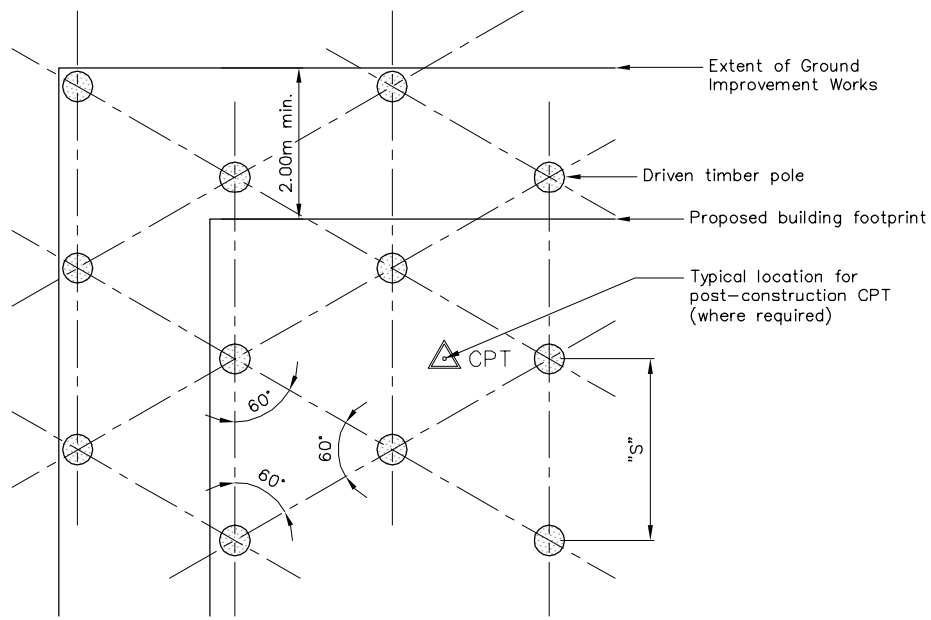
EXAMPLE DRAWING SET
PROPOSED GROUND
IMPROVEMENT WORKS

1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

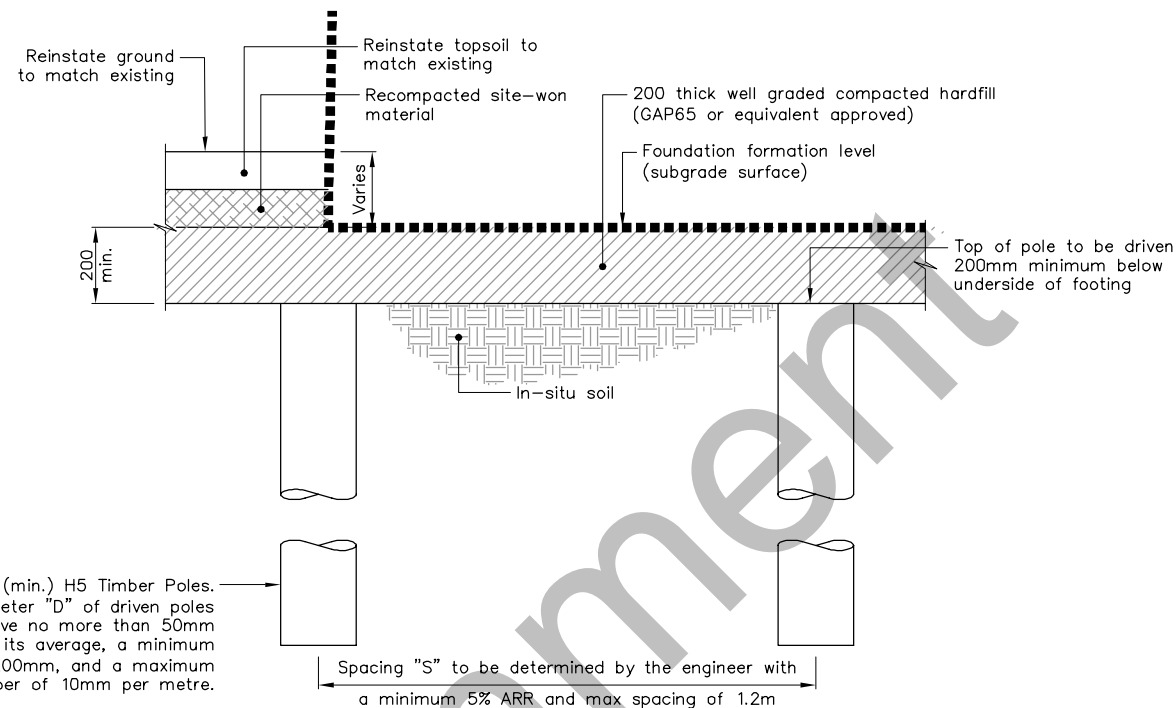
Stone Columns
Type G4 & G5a
Typical Details

DRAWING STATUS: PRELIMINARY DRAFT

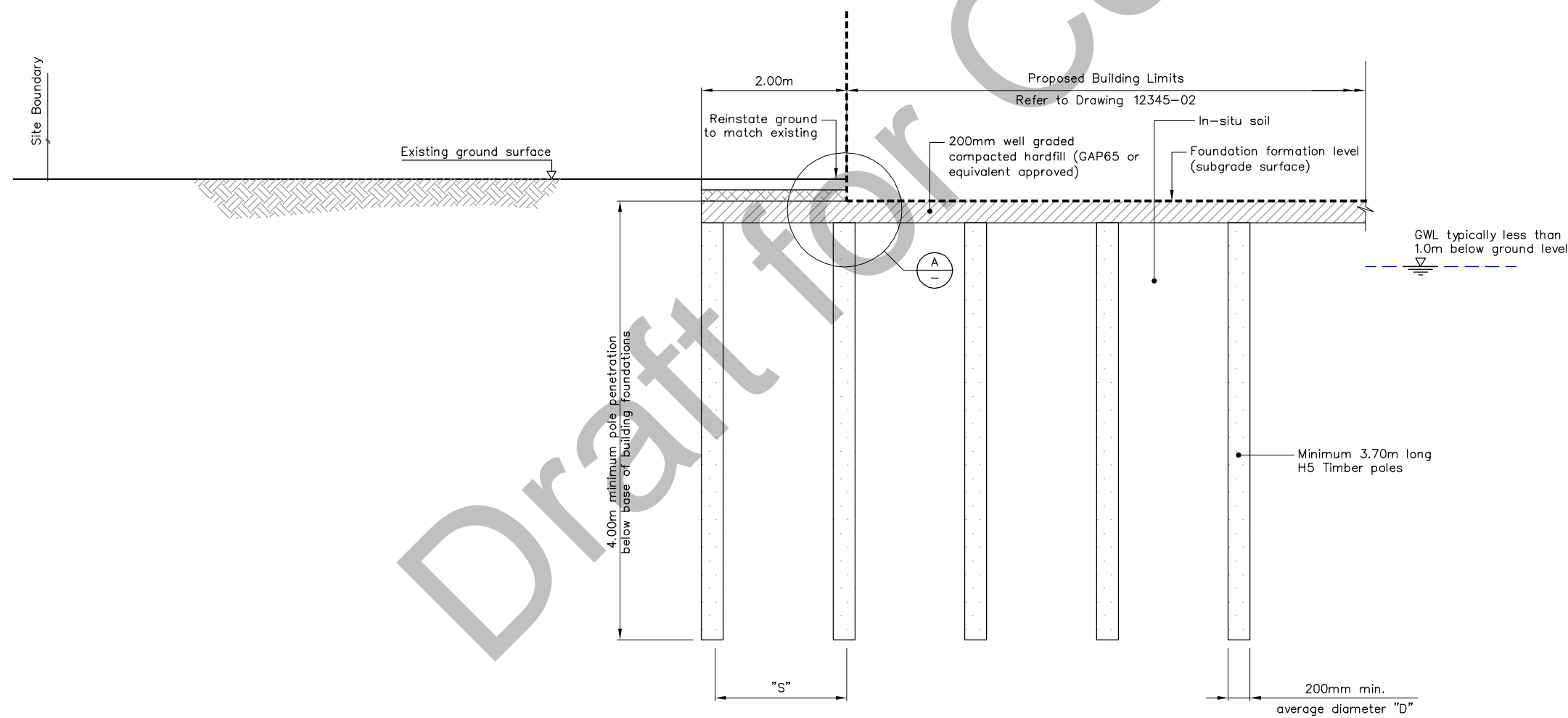
SCALES (AT A3 SIZE) AS SHOWN	DWG. No. 12345-08	REV. 1
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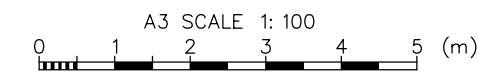
PLAN OF TYPICAL TIMBER POLE TRIANGULAR LAYOUT
SCALE 1:50



DETAIL A TOP OF TIMBER POLES
SCALE 1:20



TIMBER POLE INSTALLATION
TYPICAL SECTION
SCALE 1:50



- NOTES :
- All dimensions are in millimetres unless noted otherwise.
 - All levels are relative to the Christchurch City Datum 2012.
 - Erosion and sediment control measures to comply with Resource Consent conditions.
 - Construction noise and vibration levels shall comply with the Contract Specification.
 - This drawing shall be read in conjunction with the Contract Specification.
 - Minimum Area Replacement Ratio, ARR, shall be <inserted by Design Engineer>. Average stone column diameter "D" and spacing "S" to be proposed by the contractor and approved by the Engineer
 - The $ARR = c1 (D/S)^2$, where $c1 = \pi/4$, for square layout and $c1 = \pi(2/\sqrt{3})$ for triangular layout, D= Average Diameter, S= Spacing.
 - <Optional Note> CPT degree of improvement testing to be undertaken. Minimum CPT resistance shall be <inserted by engineer>. Refer to Specification for post-improvement CPT requirements. OR CPT degree of improvement testing is not required.

1	First Issue		
	REVISION DESCRIPTION	BY	DATE
	DESIGNED :		
	DRAWN :		
	DESIGN CHECKED :		
	DRAFTING CHECKED :		
	REFERENCE :		

CADFILE : \\12345-09.dwg
APPROVED :
NOT FOR CONSTRUCTION
This drawing is not to be used for construction purposes unless signed as approved
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CONSULTANT'S
DETAILS

EXAMPLE DRAWING SET
PROPOSED GROUND
IMPROVEMENT WORKS

1 CHRISTCHURCH ROAD
CHRISTCHURCH
CANTERBURY

Driven Timber Poles
Type G5b
Typical Details

DRAWING STATUS: PRELIMINARY DRAFT

SCALES (AT A3 SIZE) AS SHOWN	
DWG. No. 12345-09	REV. 1