Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 23 16 - Trench Excavation

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D1557 (Modified Proctor) Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m).

1.3 EXISTING CONDITIONS

.1 Establish precise field location of underground services before commencing work.

.2 Known underground and surface utility lines and buried objects are as indicated on site plan for guidance only.

.3 Refer to drainage requirements.

1.4 PROTECTION

.1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

Part 2 Products

2.1 MATERIALS

.1 Fill material: in accordance with of Section 31 23 17 – Granular Borrow (Pipe and Structures).

.2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Departmental Representative.

2.2 TOPSOIL

.1 Contractor shall restore disturbed project areas to original condition using 100mm of topsoil and hydro seed, per specifications. Contractor can import new clean topsoil, or reuse clean topsoil stripped from the disturbed project area.

.2 Stripped topsoil that is approved for reuse by the Departmental Representative shall be stockpiled at the project site at a location approved by the Departmental Representative. A sediment control fence shall be installed around the perimeter of the stockpile.

.3 The Contractor shall not spread wet topsoil.

.4 Reused topsoil shall be spread at a minimum depth of 100mm, and shall be raked to remove large clumps, rocks, and debris prior to hydro seeding, subject to the approval of the Departmental Representative.

.5 Excess stockpiled topsoil and raked material shall be disposed of per Section 31 23 16 Trench Excavation.

Part 3 Execution

3.1 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to follow depths indicated on details.

.3 Prior to placing fill over existing ground, scarify surface to depth of 150mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.4 Compact filled and disturbed areas to as follows:

.1 85% under landscaped areas.

.2 95% under concrete walk, curb and gutters.

.5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.2 TESTING

.1 Inspection and testing of soil compaction will be carried out by testing laboratory. Costs of tests will be paid by Departmental Representative.

3.3 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 The section specifies requirements for excavation and backfilling or excavation and disposal of all materials that are encountered in the excavation of trenches and excavations as shown on the drawings and/or as ordered all in accordance with this specification.

1.2 RELATED SECTIONS

.1 Section 31 23 17 – Granular Borrow (Pipe and Structures)

.2 Section 33 31 13 – Sanitary Sewer Pipe

.3 Section 33 34 00 – On-site Sewage Disposal System

1.3 REFERENCES

.1 Not Used

Part 2 Products

2.1 SOLID ROCK EXCAVATION

.1 Solid Rock Excavation shall consist of:

.1 Excavating material from solid masses of igneous, sedimentary or metamorphic rock which prior to removal was integral with the parent mass;

.2 Excavating boulders, rock and concrete fragments measuring in volume one (1) cubic metre or more which require blasting or breaking with a hydraulic breaker prior to removal from the trench, but;

.3 Notwithstanding sub clauses 2.1.1.1 and 2.1.1.2 above, the excavation of dense tills, hardpan, and other similar material shall not be classified as Solid Rock Excavation for the purpose of payment.

2.2 COMMON EXCAVATION

.1 Consists of excavating all material within the limits of the trench not classified as Solid Rock or Unclassified Excavation. Glacial till, boulder clay, broken stone, bituminous pavement and existing pipe and structures where required will be classified as Common Excavation.

2.3 UNCLASSIFIED EXCAVATION

.1 Shall consist of excavating all material encountered including excavation of existing pipe and structures where required.

Part 3 Execution

3.1 SAFETY REGULATIONS

.1 Construction methods used by the Contractor in making the excavation must safeguard public and private property and must be carried out in compliance with the Occupational Health and Safety Act or equivalent Act in the Province or Territory where the work is carried out.

3.2 TRENCH CONDITIONS

.1 The Contractor shall be responsible for the condition of all excavations. He shall be held solely responsible for damages that may be caused through lack of proper sheeting, bracing, water control, etc., and for any damage to person or property resulting from the same. The Contractor shall be responsible for protecting and supporting adjacent poles. Protection methods to be approved by the appropriate utility.

.2 The Contractor shall have a suitable trench box on site at all times when excavation operations are taking place.

.3 The excavation shall be dewatered and kept continuously dewatered. Should groundwater or sewage enter the upstream end of the pipe during construction, the Contractor shall be responsible for cleaning, at his expense, all downstream pipes through which the groundwater or sewage has flowed.

.4 The Contractor shall be responsible for and pay all costs associated with the proper disposal of water resulting from dewatering operations and shall comply with all applicable Federal and Provincial requirements.

3.3 OVER EXCAVATION

.1 Any part of the trench excavated below the specified grade shall be corrected with approved granular fill material thoroughly compacted. Where the subgrade is considered too soft to support the pipe or structure then deeper excavation will be required to permit the installation of additional granular base material.

3.4 SURPLUS EXCAVATED MATERIAL

.1 Surplus excavated material shall be material considered unsatisfactory for backfilling, roadway construction, or stockpiling, or surplus to the requirements of the Work.

.2 It shall be the Contractor's responsibility to obtain disposal sites for surplus excavated material.

.3 All costs associated with disposal of surplus excavated material shall be the Contractor's responsibility.

.4 All disposal areas shall be levelled and uniformly graded.

3.5 EXCAVATED MATERIAL

.1 Excavated material when approved shall be used to backfill excavations. Compaction of this material shall be in accordance with Section 31 23 17 Granular Borrow (Pipe and Structures).

.2 If approved by the Departmental Representative, the Contractor will be permitted to backfill excavations with excavated solid rock with fragments which are 0.030 cubic metres or less in size.

.3 If approved by the Departmental Representative, the Contractor will be permitted to reuse stripped topsoil to cover trench excavations.

3.6 ROCK EXCAVATION

.1 Rock-blasting shall be carried out under the supervision of experienced persons employed by the Contractor. No blasting shall be done outside the Contractor's normal working hours.

.2 In excavations requiring blasting, the mouth of the pipe and any portion not backfilled shall be adequately protected.

.3 Immediately prior to a blast, the Contractor shall clear the blasting area of all residents, vehicular and pedestrian traffic and shall post flag persons on each road entering the blasting area who shall stop all traffic and shall prevent such traffic from entering the area until the blast has taken place.

.4 The Contractor shall be responsible for any repair that is necessary to restore the roads, adjacent pipe and structures, and private property to their original condition due to damage caused by blasting.

.5 The Departmental Representative shall be notified if, during excavation, material appearing to conform to the classification for solid rock excavation is encountered. If the Contractor fails to give notice, the Departmental Representative will presume that the measurements taken when he first sees the excavation will give a true quantity of rock excavation.

.6 The Contractor shall arrange to have done and pay all costs associated with a PREBLAST SURVEY. The survey shall be completed by a Registered or Licensed Professional Engineer qualified and experienced in the area of preblast surveys. The survey shall examine and report on the preblast conditions of all structures, wells, etc., within a minimum radius of 250 feet or greater, as determined by the Departmental Representative conducting the survey. A copy of the preblast survey shall be filed with the Departmental Representative prior to the commencement of the work.

.7 If blasting is required, the Contractor is advised that insurance coverage for drilling and blasting is required.

3.7 SALVAGE

.1 All salvaged pipe, manhole sections, fittings, covers, grates and any other material recovered from the site shall be the property of the Departmental Representative unless the Departmental Representative designates the salvaged material to be waste material.

.2 Waste material shall be disposed of at disposal sites obtained by the Contractor. Disposal sites shall be approved for disposal of the waste material(s) subject to applicable local, Provincial, and Federal regulations.

.3 All costs associated with disposal of waste material shall be the Contractor's responsibility. The Contractor shall use care not to damage salvaged materials. The Departmental Representative will remove materials from the site that have been designated as salvage.

3.8 ADJUSTMENT TO ALIGNMENT AND/OR GRADE

.1 The Departmental Representative may adjust the alignment and/or grade of the pipe without extra compensation to the Contractor so long as the depth of excavation does not increase more than 500 millimetres.

3.9 EXISTING UNDERGROUND SERVICES

.1 All existing underground services are to be protected by the Contractor. The Contractor shall be responsible for having the appropriate authorities locate their underground services prior to construction.

.2 If excavation of the trench requires an existing culvert pipe to be temporarily removed, the Contractor shall remove and later reinstall the culvert pipe at no extra cost to the Departmental Representative. The Departmental Representative may elect to replace the pipe prior to reinstallation and the Contractor will be paid material costs only for new culvert pipe and shall install the pipe at no charge to the Departmental Representative.

3.10 WORK ON EASEMENTS

.1 The Contractor shall take utmost care when working in easements to ensure that a minimum area is disturbed. The Contractor shall confine his work to the easements. Any disturbance of property outside the limits of the easements shall be the Contractor's responsibility.

3.11 CUTTING ASPHALT

.1 The Contractor shall machine cut asphalt in a straight line prior to excavation.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 This section specified requirements for supplying, placing and compacting granular borrow for sub-bedding, bedding, haunching, initial backfilling, backfilling, and area grading, as shown on the drawings and/or as ordered, all in accordance with this specification. This is applicable to buried septic tank, buried distribution box, and new buried gravity sewer pipe between the existing sanitary manhole and disposal field.

.2 Perforated piping in on-site sewage disposal system discharge field will comply with the requirements of Section 33 34 00 - Onsite Sewage Disposal System.

1.2 RELATED SECTIONS

.1 Section 31 23 16 – Trench Excavation

.2 Section 33 31 13 – Sanitary Sewer Pipe

.3 Section 33 34 00 – Onsite Sewage Disposal System

1.3 REFERENCES

.1 All ASTM specifications and latest revisions are considered part of this specification.

Part 2 Materials

2.1 PITRUN GRAVEL

.1 To be free from objectionable amounts of flat or elongated pieces, ice and frozen sections, lumps, slag, cinders, ashes, clay, rubbish or other deleterious materials.

.2 To be natural bank run material and conform to the following grain size distribution for pit run gravel when tested in accordance with ASTM C136 and C117:

Pit Run Gravel	
ASTM Sieve Size (mm)	% Passing
125.0	100
100.0	95-100
75.0	82-100
50.0	62-100
37.5	52-100
31.5	
25.0	
19.0	30-90
12.5	
9.5	22-79

4.75	16-66
2.36	12-55
1.18	9-44
.300	4-25
.075	0-7

2.2 CRUSHED GRAVEL

.1 To be free from objectionable amounts of flat or elongated pieces, ice and frozen sections, lumps, slag, cinders, ashes, clay, rubbish or other deleterious materials.

.2 To be produced by the processing of gravel and conform to the following grain size distribution for Crushed Gravel when tested in accordance with ASTM C136 and C117:

Crushed Gravel	
ASTM Sieve Size (mm)	% Passing
125.0	
100.0	
75.0	
50.0	
37.5	100
31.5	95-100
25.0	83-100
19.0	70-90
12.5	55-78
9.5	45-72
4.75	30-57
2.36	20-46
1.18	14-35
.300	5-19
.075	0-6

.3 Crushed gravel shall have a minimum of 40% of the particles, by mass, having at least one fractured face, when tested in accordance with ASTM D5821.

2.3 SCREENED STONE

.1 To be free from objectionable amounts of flat or elongated pieces, ice and frozen sections, lumps, slag, cinders, ashes, clay, rubbish or other deleterious materials.

.2 To meet the following grain size distribution for screened stone when tested in accordance with ASTM C136 and C117:

Screened Stone	
ASTM Sieve Size (mm)	% Passing
125.0	
100.0	

75.0	
50.0	
37.5	100
31.5	
25.0	35-100
19.0	
12.5	20-60
9.5	
4.75	0
2.36	
1.18	
.300	
.075	

Part 3 Execution

3.1 SCREENED STONE SUB-BEDDING

.1 In soft sub-grade conditions when directed by the Departmental Representative, and in all cases where pipe is installed in a rock trench, the Contractor shall excavate to a depth of 300 millimetres below the bottom of the pipe and place a layer of "Screened Stone" below the pipe zone material. This material will provide a 150 millimetre layer of sub-bedding. When the Departmental Representative orders the use of Screened Stone Sub-Bedding, the screened stone sub-bedding will be measured and paid for under this item.

.2 If, during the course of the work, the Contractor encounters water in the trench, he shall be responsible for dewatering the trench at no expense to the Departmental Representative.

3.2 PIPE ZONE MATERIAL

.1 Pipe zone material (including bedding, haunching and initial backfill), shall be from the bottom of the trench excavation to 50 millimetres above the top of the pipe in areas where common material is used to backfill the pipe and to a depth of 600 mm above the pipe in areas where excavated rock is used to backfill the pipe.

.2 Pipe zone material for a single pipe trench, perforated drain pipe or for the lowest pipe in a multiple pipe trench, shall be made with “Screened Stone” unless otherwise ordered.

.3 Pipe zone material may be machine placed and shall be uniformly compacted before the pipe is installed. Bellholes shall be provided at each bell joint to permit proper assembly while maintaining uniform pipe support.

.4 Bedding for precast concrete structures shall be a minimum of three hundred (300) millimetres deep and shall extend a minimum of three hundred (300) millimetres beyond the exterior of the structure.

3.3 FOUNDATION BACKFILL

.1 Foundation backfill shall consist of backfilling trenches and foundations as shown on the detail drawings not including interzone material.

.2 Backfilling shall be placed in such a manner as will not unduly stress or damage the structures. If the material is to be placed otherwise than by hand the method must be approved. In general, the height of dump shall not exceed the depth of fill then over the structure.

.3 Granular borrow shall be used only when suitable materials are not available from foundation excavation.

3.4 ROADWAY RESTORATION

.1 In all cases where the trench has been excavated across or along an asphalt surface and where the trench has been excavated along the roadway shoulder, the top of the trench restoration shall consist of a four hundred fifty (450) millimetre compacted thickness layer of Pit Run Gravel followed by a two hundred (200) millimetre compacted thickness of crushed gravel.

.2 The Contractor shall remove sufficient crushed gravel from the base material prior to restoring the asphalt surface. Crushed gravel salvaged from this operation may be used by the Contractor at other locations.

.3 Where the trench has been excavated along or across a gravel roadway the top of the trench shall consist of a four hundred fifty (300) millimetre compacted thickness layer of Pit Run Gravel followed by a one hundred (150) millimetre compacted thickness of crushed gravel.

3.5 COMPACTION

.1 Pipe Zone Material

.1 Crushed gravel and pit run gravel used as pipe zone material shall be placed and uniformly compacted to ninety-five (95%) percent Standard Proctor Density (ASTM 698). Approved pneumatic tampers, vibrating compactors or other approved methods will be used to consolidate the material.

.2 Foundation Backfill

.1 Backfill under roadway, driveways, railroads, and when directed, shall be placed and uniformly compacted to ninety-five (95%) percent Standard Proctor Density (ASTM 698). Approved pneumatic tampers, vibrating compactors or other approved methods will be used to consolidate the material.

.2 Backfilling of all other areas must be made in an approved manner but will not require mechanical compaction. The Contractor is reminded that he is responsible for all settlement which occurs until the end of the Warranty Period.

.3 Roadway Restoration

.1 Pit Run Gravel and Crushed Gravel placed as roadway base shall be uniformly compacted to ninety-five (95) percent Standard Proctor Density (ASTM 698) using approved compaction methods.

3.6 TESTING

.1 The Contractor shall at his expense, engage a qualified Materials Testing Firm to test the granular borrow. The materials testing firm shall test the borrow material prior to placement to confirm the material meets the materials specification for the type of material to be supplied. Additional tests shall be performed anytime the source of material changes or the composition of the material appears to change from that originally sampled and approved. Testing shall be in accordance with ASTM C136 and C117, latest editions.

.2 The testing firm shall also at the Contractor's expense perform nuclear gauge compaction testing to verify that specified compaction is being obtained.

.3 The testing firm shall at minimum conduct two (2) compaction tests at locations to be determined by the Departmental Representative during the first week of operation referencing trench reinstatement.

.4 If the tests indicate that the Contractor is achieving the required level of compaction, at the Departmental Representative's discretion, the Contractor may be relieved of the requirement to have additional testing done unless conditions vary from those encountered at the time of original testing.

.5 If original test results indicate that the Contractor is not achieving the required compaction he shall, at his expense, have the Materials Testing Firm conduct additional testing as referred to confirm to the satisfaction of the Departmental Representative that the Contractor can consistently achieve the required level of compaction.

.6 The testing firm shall keep a careful record of where each test was taken.

.7 The testing firm shall be approved by the Departmental Representative and a copy of all test results shall be mailed directly to the Departmental Representative by the Materials Testing Firm. Complete test results and a letter stating that the materials supplied and placed met or exceeded the Contract Specifications or identifying any variations and their anticipated impact must be received prior to approving final payment.

.8 The letter referred to in subsection 3.8.7 must be signed and sealed by a Professional Engineer registered in the Province or Territory where the Work is performed, and who is employed by the Materials Testing Firm.

3.7 CLEAN UP

.1 The Contractor shall sweep all asphalt surfaces free of debris when directed, where such debris has resulted from granular borrow operations.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 This item shall consist of the supplying, placing and compacting of granular borrow for area grading; construction of the pit run gravel subbase and crushed rock base for the Well House Access Road and Septic Tank Access Road; All work shall be as shown on the drawings and/or as ordered, all in accordance with this specification.

1.2 RELATED SECTIONS

.1 Not used.

1.3 REFERENCES

.1 All ASTM specifications and latest revisions are considered part of this specification.

Part 2 Materials

2.1 PITRUN GRAVEL

.1 To be free from objectionable amounts of flat or elongated pieces, ice and frozen sections, lumps, slag, cinders, ashes, clay, rubbish or other deleterious materials.

.2 To be natural bank run material and conform to the following grain size distribution for pit run gravel when tested in accordance with ASTM C136 and C117:

Pit Run Gravel	
ASTM Sieve Size (mm)	% Passing
125.0	100
100.0	95-100
75.0	82-100
50.0	62-100
37.5	52-100
31.5	
25.0	
19.0	30-90
12.5	
9.5	22-79
4.75	16-66
2.36	12-55
1.18	9-44
.300	4-25
.075	0-7

2.2 SANDSTONE

.1 Shall be composed of clean uncoated particles subject to location and suitability approval and shall have not more than five percent (5%) larger than eighty (80) millimetres diameter.

2.3 CRUSHED ROCK

.1 To be free from objectionable amounts of flat or elongated pieces, ice and frozen sections, lumps, slag, cinders, ashes, clay, rubbish or other deleterious materials.

.2 To be quarried from a source that is solid in situ and conform to the following grain size distribution for Crushed Rock when tested in accordance with ASTM C136 and C117:

Crushed Rock	
ASTM Sieve Size (mm)	% Passing
125.0	
100.0	
75.0	
50.0	
37.5	100
31.5	95-100
25.0	81-100
19.0	66-90
12.5	50-77
9.5	41-70
4.75	27-54
2.36	17-43
1.18	11-32
.300	4-19
.075	0-8

Part 3 Execution

3.1 AREA GRADING

.1 This item shall consist of the supply and placement of pit run gravel as shown on the drawings or as directed to elevate the Well House Access Road to subgrade. The material shall be spread and uniformly compacted (95%) Standard Proctor Density.

.2 Sandstone or other approved granular material may be used subject to the approval of the Departmental Representative.

3.2 BASE PREPARATION FOR ACCESS ROADS

.1 The base for the Well House and Septic Tank access roads shall consist of a three hundred (300) millimetre compacted thickness layer of pit run gravel followed by a one hundred and fifty (150) millimetre compacted thickness layer of crushed stone.

.2 Pit run gravel and crushed stone placed as base preparation shall be uniformly compacted to a density of at least ninety-five percent (95%) Standard Proctor Density using approved compaction methods.

3.3 TESTING

.1 The Contractor shall at his expense, engage a qualified Materials Testing Firm to test the granular borrow. The materials testing firm shall test the borrow material prior to placement to confirm the material meets the materials specification for the type of material to be supplied. Additional tests shall be performed anytime the source of material changes or the composition of the material appears to change from that originally sampled and approved. Testing shall be in accordance with ASTM C136 and C117, latest editions.

.2 The testing firm shall also at the Contractor's expense perform nuclear gauge compaction testing to verify that specified compaction is being obtained.

.3 The testing firm shall at minimum conduct two (2) compaction tests at locations to be determined by the Departmental Representative during the first week of operation referencing trench reinstatement.

.4 If the tests indicate that the Contractor is achieving the required level of compaction, at the Departmental Representative's discretion, the Contractor may be relieved of the requirement to have additional testing done unless conditions vary from those encountered at the time of original testing.

.5 If original test results indicate that the Contractor is not achieving the required compaction he shall, at his expense, have the Materials Testing Firm conduct additional testing as referred to confirm to the satisfaction of the Departmental Representative that the Contractor can consistently achieve the required level of compaction.

.6 The testing firm shall keep a careful record of where each test was taken.

.7 The testing firm shall be approved by the Departmental Representative and a copy of all test results shall be mailed directly to the Departmental Representative by the Materials Testing Firm. Complete test results and a letter stating that the materials supplied and placed met or exceeded the Contract Specifications or identifying any variations and their anticipated impact must be received prior to approving final payment.

.8 The letter referred to in subsection 3.8.7 must be signed and sealed by a Professional Engineer registered in the Province or Territory where the Work is performed, and who is employed by the Materials Testing Firm.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 This item shall consist of supplying all tools, labour, equipment and materials required to install sediment fencing as shown on the drawings, and/or in accordance with this specification.

1.2 RELATED SECTIONS

.1 Not used

1.3 REFERENCES

.1 All NBDTI Standard Specifications (latest edition).

Part 2 Materials

2.1 SEDIMENT CONTROL FENCE AND SUPPORT POSTS

.1 Shall be as specified by the NBDTI Standard Specifications Item No. 602 Sediment Control Fence.

Part 3 Execution

3.1 SEDIMENT CONTROL FENCE

.1 Sediment control fence shall be installed and maintained in compliance with NBDTI Standard Specifications Item 602 Sediment Control Fence.

.2 In general sediment control fence shall be installed in a continuous fashion perpendicular to the direction of flow at the following locations:

- .1 along the contours of exposed slopes;
- .2 at the toe of fill slopes (a few metres out from the toe of slope);
- .3 the downhill side of large cuts;
- .4 adjacent to streams; and
- .5 at other locations where deemed necessary by the Departmental Representative.

3.2 REMOVAL AND RESTORATION

.1 When deemed by the Departmental Representative to be no longer required, the Contractor shall remove the sediment control fence and/or erosion control structures and restore the area as directed. Care shall be taken during removal operations to ensure the adjacent ground surfaces are not disturbed.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This Section specifies requirements for supplying and installing various geotextiles to be used for sedimentation control.

1.2 SAMPLES

.1 Submit to the Departmental Representative samples at least one (1) week prior to commencing work a minimum of 1 m^2 of each type of geotextile material to be used along with the technical data.

1.3 MILL CERTIFICATES

.1 Submit to the Departmental Representative copies of mill test data and certificates

Part 2 Products

2.1 MATERIALS

.1 The geotextiles shall be of non-woven construction comprising synthetic, non-biodegradable fibres. Fibres used in the manufacture of geotextiles and the threads used in joining geotextiles by sewing shall consist of long chain synthetic polymers composed of at least 85% by weight polyolefins, polyesters or polyamides. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including selvages.

.2 Minimum physical requirements for the geotextile shall be as follows:

Property	# 1
Grab Tensile (N)	445
Tear (N)	222
Mullen Burst (MPa)	1.48

.3 Type "#1" to be Terrafix 270 R or approved equal.

.4 Acceptance of geotextile material shall be based on ASTM D4759.

Part 3 Execution

3.1 DELIVERY & STORAGE

.1 Each individual roll of geotextile shall be wrapped and covered to protect the fabric from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, debris and rodents.

.2 Use equipment that does not contact the material itself during loading, unloading and handling. Slings or other lifting devices should provide adequate support without damaging the material. Off-load in a minimum of steps directly to the storage or installation area.

.3 Store all rolls of geotextile on smooth, flat surfaces raised above the ground that provide continuous support to the rolls. Maintain additional protective cover if rolls are to be stored in excess of 30 days.

3.2 INSTALLATION

.1 Where fabric seams are not sewn, overlaps shall be a minimum of 1000 mm.

.2 When placing fabric which incorporates a sewn seam, the seam shall be placed "thread up" to facilitate inspection and repair.

.3 Sewn seams shall be constructed using a "J" or a "Prayer" configuration and shall be overlapped a minimum of 150 mm prior to sewing. Stitches shall be such that they will have an elongation at break equal to or greater than the geotextile when tested in the plane of the seam. Ultimate grab strength perpendicular to the seam shall be equal to or exceed 90% of the grab tensile strength of the geotextile.

.4 Welding will not be permitted unless it can be clearly demonstrated that a continuous weld can be achieved having an elongation at break equal to or greater than the original geotextile.

.5 Thread for sewn seams shall have an equal or better resistance to chemical and biological degradation as that of the geotextile. For inspection purposes, the thread used shall be of a colour that will contrast with the original geotextile. Threads comprising of any organic fibres or nylon will not be accepted.

.6 No horizontal seams shall be allowed on side slopes.

3.3 PROTECTION

.1 Do not permit passage of any vehicle directly on the geotextile at any time. Fill should be placed by end-dumping or long reach equipment.

.2 Maximum drop weight for fill directly onto the geotextile shall not exceed 1 metre.

3.4 REPAIRS

.1 Repair seams which open or fabric tears during fill placement by removing fill and resetting the fabric. Additional geotextile shall be placed over the area, extending beyond the perimeter of the fault a distance corresponding to the lapping requirements. Where practical, the repair fabric should be pinned or stapled into place at intervals equal to or less than one eighth the perimeter of the damage or 2 metres, whichever is the lesser.

.2 On slopes flatter than or equal to 20 percent, a patch made from the same geotextile shall be sewn into place no closer than 75 mm from the edge.

.3 Should any horizontal tear exceed 10 percent of the width of the roll, that roll shall be removed from the slope and replaced.

.4 On slopes steeper than 20 percent, a patch made from the same geotextile shall be sewn in place with a minimum of 600 mm overlap.

END OF SECTION