Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast-in-Place Concrete.

.2 Section 07 21 13 – Board Insulation.

.3 Section 07 26 16 – Under-Slab Vapour Retarder.

.4 Section 31 66 15 – Helical Foundation Piles.

.5 Section 32 12 16 – Asphalt Paving.

.6 Section 32 13 15 – Concrete Paving, Sidewalks, Curbs and Gutters.

.7 Section 32 15 40 – Crushed Stone Surfacing.

.8 Section 32 91 21 – Topsoil Placement and Grading.

.9 Section 33 05 16.01 – Catch Basins.

.10 Section 33 41 00 – Storm Utility Drainage Piping.

1.2 DEFINITIONS

.1 Backfill: Soil material or controlled low strength material used to fill excavations.

.1 Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

.2 Final Backfill: Backfill placed over initial backfill to fill a trench.

.2 Base Course: Course placed between the sub base course and hot mix asphalt paving.

.3 Bedding Course: Course placed over the excavated sub grade in a trench before laying pipe.

.4 Borrow Soil: Satisfactory soil imported from off site for use as fill or backfill.

.5 Capillary Break: Course supporting slab on grade that also minimizes upward capillary flow of pore water.

.6 Common Excavation:

.1 The excavation of materials, including hardpan, quicksand, and frozen earth; also rock, concrete or masonry less than 1.0 m^3 in volume shall be classified as common excavation.

.7 Fill: Soil materials used to raise existing grades.

.8 Rock:

.1 The excavation of rock, concrete or masonry exceeding 1.0 m^3 in volume; and solid ledge rock, concrete or masonry that requires for its removal drilling, blasting, wedging, sledging, barring or breaking with a power operated hand tool shall be classified as rock excavation. Soft or disintegrated rock, concrete or masonry that can be removed with a hand pick, power operated excavator or shovel; and loose, shaken or previously blasted rock will not be classified as rock excavation.

.9 Site Excavated Materials: Site excavated soil is considered as only site material removed by required excavation and grading.

.10 Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below ground surface.

.11 Sub-Base Course: Course placed between the sub-grade and base course for hot mix asphalt pavement, and cement concrete pavement or sidewalk.

.12 Sub-Grade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub base, drainage fill, or topsoil materials.

.13 Utilities: On site underground pipes, conduits, ducts, and cables including, but not limited to underground services within buildings.

1.3 STANDARDS

.1 Work of this section shall meet or exceed province of Newfoundland and Labrador design and construction standards, shall meet or exceed requirements of this Section, and shall meet or exceed the following:

.1 Section 01 11 10 – General Requirements: item 1.9 Regulatory Requirements.

.2 Section 01 11 10 – General Requirements: item 1.7 Health and Safety.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide required information in accordance with Section 01 11 10 – General Requirements: Submittal Procedures.

.2 Submit product data for the following:

.1 Geotextile cloth.

.2 Controlled low-strength material, including design mixture.

.3 Conduct condition survey of adjoining construction and site improvements, including finish surfaces, survey benchmarks, and monuments that may be affected by work:

.4 Submit pre-excavation photographs or videotape before starting any earthwork indicating existing conditions of adjoining construction and site improvements, including finish surfaces that may be misconstrued as damage caused by earthwork operations for this Project

.5 Identify any interferences that could affect the Work and notify the Departmental Representative for additional information.

1.5 QUALITY ASSURANCE

.1 Pay costs for testing and inspection as a part of the Contract.

.2 Carry out testing of materials and compaction of backfill, fill and unshrinkable fill using a testing agency acceptable to the Departmental Representative as follows:

.1 Perform testing under the supervision of a registered professional engineer.

.2 Have testing results signed, stamped and sealed by a registered professional engineer and submitted to the Departmental Representative and Contractor.

.3 Correct any deficiencies noted in the report as directed by the testing agency.

.3 Notify testing agency no later than one week before backfilling or filling operations; provide a 20 kg sample of backfill, fill and unshrinkable fill material proposed for use to confirm properties; start backfilling or filling operations when material has been accepted by Departmental Representative for intended use.

.4 Notify testing agency no later than 48 hours before backfilling or filling operations so that compaction tests can be carried out by designated testing agency; inspect footing excavations before placing footings; results of compaction tests will be submitted to Departmental Representative and Contractor.

1.6 PROTECTION

.1 The Contractor shall be responsible for locating and protecting all existing underground and surface structures, utility pipelines, overhead lines and poles, fences, water and sewer mains, building services, cables, culverts, sidewalks and other works. All damage incurred shall be repaired by the Contractor at its expense.

Part 2 Products

2.1 GENERAL

.1 Supply all labour, materials and equipment required for site grading.

2.2 SOURCE OF SUPPLY

.1 Imported Fill Materials: Consider only fill materials that fully meet specified requirements, including gradations.

2.3 SOIL FILL MATERIALS

.1 General Engineered Fill: Comprised of clean, inorganic granular or clay soils.

.2 Select Engineered Fill: Comprised of clean, well graded granular soils or inorganic low plastic clay soils:

.1 Granular soils used for select engineered fill shall consist of relatively clean, well graded, sand or mixture of sand and gravel (maximum size 75 mm).

.2 Low plastic clay used for select engineered fill shall have the following range of Atterberg limits:

.1 Liquid Limit = 20 to 40%

.2 Plastic Limit = 10 to 20%

.3 Plasticity Index = 10 to 30%

.3 Structural Fill: Comprised of clean, well graded inorganic granular soils.

.4 Lean Mix Concrete: Self-compacting, low-strength concrete having a minimum 28-day compressive strength of 3.5 MPa.

2.4 GRANULAR FILL MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances

that would act in deleterious manner for use intended. Flat and elongated particles of coarse aggregate: to ASTM D4791.

.2 Source aggregate materials locally to extent possible, meeting requirements.

.3 Rock Borrow: Blasted or crushed rock consisting of durable crushed stones, having 100% by mass pass through a 150mm x 150mm screen, and a maximum 10% by mass pass through a maximum 100mm x 100mm screen. Rock to consist of angular fragments obtained by breaking and crushing solid or natural rock, reasonably free from thin, flat elongated or other objectionable pieces and fines or as otherwise approve by the Departmental Representative.

.4 Fill against structure:

.1 Blasted or crushed rock as approved by Departmental Representative. Gradation to be within following limits:

Sieve Designation	**% Passing**
112 mm	100
40 mm	60 - 85
5 mm	25 - 50
0.315 mm	5 - 15
0.080 mm	2 - 7

.5 Granular Sub-Base: Class B, to Section 32 11 16.01 – Granular Sub-Base.

.6 Granular Base: Class A, to Section 32 11 23 – Aggregate Base Courses.

.7 Select Backfill Material: from excavations or other sources, approved by Departmental Representative for use intended, dry, unfrozen and free from ricks larger than 80 mm, cinders, ashes, sods, refuse or other deleterious or unsuitable materials.

.8 Unshrinkable Fill: proportioned and mixed to provide:
.1 Maximum compressive strength: 1.0 MPa at 28 days.
.2 Maximum Portland cement content: 25 kg/m3.
.3 Minimum strength of 0.07 MPa at 24 hours.
.4 Concrete aggregates: to CAN/CSA A23.1.
.5 Portland cement: Type GU.
.6 Slump: 150 mm minimum.

.9 Pit Run Gravel: Comprised of crushed stone or gravel, natural stone and sand, having no cobbles larger than 80 mm in diameter and having a maximum organic content of 2%, within the following nominal gradation limits:

Sieve Size (mm)	**% Passing by Weight**	**Comments**
80	100	
50	55-100	Total sample
25	38-100	Material passing 50 mm sieve
16	32-85	
5	20-65	
0.4	6-30	
.08	2-15	
0.0	0	

.10 Crushed Gravel: Comprised of crushed stone or gravel having at least two broken faces, crushed or natural sand and having a maximum organic content of 2%, within the following nominal gradation limits:

.1 Liquid limit of material passing 0.4 mm sieve shall not exceed 25%.

.2 Plasticity index of material passing 0.4 mm sieve shall not exceed 6%.

.3 Minimum of 50%, by weight, of material retained on 5 mm sieve shall have at least one face resulting from fracture.

Sieve Size (mm)	% Passing by Weight	Comments
25	100	
20	100	Total sample
10	60-92	Material passing 20 mm sieve
5	37-62	
2	26-44	
0.4	12-27	
0.15	7-18	
0.08	2-8	

.11 Coarse Gravel: Comprised of crushed stone or gravel, natural stone, crushed or natural sand and having a maximum organic content of 2%, within the following nominal gradation limits:

Sieve Size (mm)	Percent Passing By Weight	Comments
50	100	
40	90-100	Total Sample
20	35-70	Material Passing 40 mm Sieve
10	10-30	
5	0-5	

.12 Sand: Comprised of crushed or natural sand and having a maximum organic content of 2%, within the following nominal gradation limits:

Sieve Size (mm)	Percent Passing By Weight	Comments
10	65-100	
5	50-90	Total Sample
2	35-75	Material Passing 10 mm Sieve
0.4	10-45	
0.15	0-20	
0.08	0-10	

.13 Clean Washed Gravel: Comprised of crushed stone or gravel, or natural stones and being free draining with less than 5% silt or clay content, and no organic material, within the following nominal gradation limits:

Sieve Size (mm)	Percent Passing By Weight	Comments
38	100	Free Draining Material
10	65-100	Total Sample
5	50-90	Material Passing 10 mm Sieve
2	35-75	
0.4	10-45	
0.15	0-20	
0.08	0-5	

2.5 GEOTEXTILE MATERIALS

.1 Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, manufactured from polyolefin or polyester and having elongation less than 50% in accordance with AASHTO M288 and as follows:

.1 Survivability: Class 2.

.2 Apparent Opening Size: 0.250 mm sieve, maximum in accordance with ASTM D4751.

.3 Permittivity: 0.02 per second, minimum in accordance with ASTM D4491.

.4 UV Stability: 50% after 500 hours' exposure in accordance with ASTM D4355.

2.6 ACCESSORIES

.1 Warning Tape for Buried Utilities: Acid and alkali resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 150 mm wide x 100 mm thick, continuously inscribed with a description of the utility; coloured as follows:

.1 Red: Electric.
.2 Yellow: Gas, oil, steam, and dangerous materials.
.3 Orange: Telephone and other communications.
.4 Blue: Water systems.
.5 Green: Sewer systems

Part 3 Execution

3.1 PREPARATION

.1 Notify Departmental Representative minimum two days before beginning excavating operations.

.2 Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations:

.3 Contact all affected utility companies regarding exact location and status of all utilities, voltage of underground and overhead power lines and pressure of natural gas lines.

.4 Notify Departmental Representative if any utility lines have been omitted from or incorrectly indicated on Drawings.

.5 Identify known underground utilities. Stake and flag locations. Identify and flag surface and aerial utilities.

.6 Notify utility company to remove and relocate utility lines.

.7 Coordinate preparation of sub-grade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface as required.

.8 Fence open excavations in accordance with Section 01 11 10 – General Requirements: Temporary Barriers and Enclosures.

.9 Coordinate and maintain erosion and sedimentation controls in accordance with Section 01 11 10 – General Requirements: Environmental Procedures during earthwork operations.

.10 Provide protective insulating materials to protect sub-grades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

.1 Prevent surface water and ground water from entering excavations, from ponding on prepared sub-grades, and from flooding Project site and surrounding area.

.2 Protect sub-grades from softening, undermining, washout, and damage by rain or water accumulation.

.3 Reroute surface water runoff away from excavated areas; do not allow water to accumulate in excavations; do not use excavated trenches as temporary drainage ditches.

3.3 SHORING AND UNDERPINNING

.1 Coordinate and maintain shoring and underpinning as required.

3.4 EXCAVATION: GENERAL

.1 Excavate when conditions are dry; avoid excavating under wet conditions or when wet conditions are anticipated.

.2 Perform work by hand and cut roots with a sharp axe when excavating is necessary through roots of plant materials identified to remain.

.3 Protect excavations for bearing surfaces from freezing, excessive wetting or drying; recondition or replace bearing surfaces that have been wetted, dried or frozen using non shrink fill; notify the Departmental Representative for additional criteria before proceeding with reconditioning.

.4 Place spoil piles a minimum of 1000 mm back from edge of excavations; place any other material capable of causing injury or sliding into excavation on the back side of spoil piles; do not operate machinery in close proximity to edge of excavation, and as follows:

.1 Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing.

.2 Place, grade, and shape stockpiles to drain surface water.

.3 Cover to prevent windblown dust.

.4 Keep spoil materials outside of drip line of remaining trees.

.5 Provide sufficient ventilation to excavations where gas powered compaction equipment will be used in accordance with Section 01 11 00 – General Requirements: Health and Safety.

.6 Expose service connections and utilities to be crossed to confirm horizontal and vertical alignment of existing utilities.

.1 Expose existing utility lines by hand excavation to confirm location before machine digging within 600 mm of lines.

.2 Maintain and protect existing above and below grade utilities that pass through work area.

.3 Protect active utility lines exposed by excavation, from damage.

.4 Hand excavate to final elevations and dimensions.

.5 Support trench in a manner approved by utility where existing pipes, ducts or other underground services intersect a trench.

.7 Use safe operating practices and maintain safe working distances where existing overhead lines are in traffic areas, or where equipment will be operating in close proximity to overhead lines:

.1 Temporarily support poles in a manner approved by utility where existing overhead line poles are adjacent to excavations.

.2 Tag safe operating distance with fluorescent flagging or other highly visible means.

.3 Post signs to identify overhead line voltage.

.8 Excavate to sub-grade elevations indicated, and as follows:

.1 Replace unsatisfactory soil materials with satisfactory soil materials where excavated materials intended for fill and backfill include unsatisfactory soil materials and Rock.

.2 Remove Rock to lines and grades indicated to permit installation of permanent construction to the following tolerances:

.1 Minimum of 600 mm from outside of concrete forms other than at footings.

.2 Minimum of 300 mm from outside of concrete forms at footings.

.3 Minimum of 150 mm from outside of minimum required dimensions of concrete cast against grade.

.4 Outside dimensions of concrete walls indicated as cast against Rock without forms or exterior waterproofing treatments.

.5 Minimum of 150 mm from beneath bottom of concrete slabs on grade.

.6 Minimum of 150 mm from beneath pipe in trenches, and the greater of 600 mm wider than pipe or 1065 mm wide.

3.5 EXCAVATION: STRUCTURES

.1 Excavate to indicated elevations and dimensions within a tolerance of 25 mm; extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and to allow for site reviews and inspections.

.2 Take care not to disturb bottom of excavation for load bearing foundations and footings; excavate by hand to final grade just before placing concrete reinforcement; trim bottoms to required lines and grades to leave solid base to receive other work.

.3 Stop excavations 150 mm to 300 mm above bottom of pile cap before piles are placed; remove loose and displaced material after piles are driven; excavate to final grade, leaving solid base to receive concrete pile caps.

.4 Excavate for underground utility structures to elevations and dimensions indicated within a tolerance of 25 mm; prevent disturbance to bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION: SIDEWALKS AND PAVEMENTS

.1 Excavate surfaces at intended sidewalk and pavement areas to indicated lines, cross sections, elevations, and sub-grades.

3.7 EXCAVATION: UTILITY TRENCHES

.1 Excavate trenches to indicated gradients, lines, depths, and elevations; excavate trenches beyond building perimeter to allow for installation of top of pipe below frost line.

.2 Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit and as follows:

.1 Excavate trench walls vertically from trench bottom to 300 mm higher than top of pipe or conduit.

.2 Allow for 300 mm clearance on each side of pipe or conduit.

.3 Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit; shape sub grade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits; remove projecting stones and sharp objects along trench sub grade, and as follows:

.1 Hand excavate trench bottoms and support pipe and conduit on undisturbed sub grade for pipes and conduit less than 150 mm in nominal diameter and flat bottomed, multiple duct conduit units.

.2 Shape bottom of trench to support bottom 90 mm of pipe circumference for pipes and conduit greater than 150 mm in nominal diameter; fill depressions with tamped sand backfill.

.3 Excavate trenches 150 mm deeper than elevation required in Rock or other unyielding bearing material to allow for bedding course.

3.8 SUB-GRADE REVIEW

.1 Notify Departmental Representative when excavations have reached required sub-grade.

.2 Continue excavation and replace with compacted backfill or fill material as directed where Departmental Representative determines that unsatisfactory soil is present.

.3 Proof roll sub grade below the building slabs and pavements using heavy pneumatic tired equipment to identify soft pockets and areas of excess yielding; proof roll dry sub-grades having optimal moisture content, and as follows:

.4 Completely proof roll sub grade in one direction, repeating proof rolling in direction perpendicular to first direction; limit vehicle speed to 5 km/h.

.5 Proof roll using a loaded 10 wheel, tandem axle dump truck weighing not less than 14 tonnes.

.6 Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting as determined by Departmental Representative and replace with compacted backfill or fill as directed.

.7 Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Departmental Representative, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

.1 Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation using lean concrete fill having 28-day compressive strength of 17.2 MPa; refer to Section 32 13 13 – Concrete Paving, Sidewalks, Curbs and Gutters for concrete materials.

.2 Fill unauthorized excavations under other construction or utility pipe as directed by Departmental Representative.

3.10 BACKFILL

.1 Place backfill on sub-grades free of mud, frost, snow, or ice.

.2 Place and compact backfill in excavations promptly after the completion of the following:

.1 Construction below finish grade.

.2 Surveying locations of underground utilities for Project Record Documents.

.3 Testing and inspecting of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of trash and debris.

.6 Removal of temporary shoring and bracing, and sheeting.

.7 Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.11 UTILITY TRENCH BACK FILL

.1 Place backfill on sub-grades free of mud, frost, snow, or ice.

.2 Place and compact bedding course on trench bottoms; shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

.3 Backfill trenches excavated under footings and within 450 mm of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings.

.4 Provide 100 mm thick, concrete base slab support for piping or conduit less than 750 mm below surface of roadways; completely encase piping or conduit in a minimum of 100 mm of concrete before backfilling or placing roadway sub-base after installing and testing.

.5 Place and compact initial soil backfill, free of particles larger than 25 mm in any dimension to a height of 300 mm over utility pipe or conduit.

.6 Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit; coordinate backfilling with utilities testing.

.7 Backfill voids with satisfactory soil while installing and removing shoring and bracing.

.8 Place and compact final backfill of satisfactory soil to final sub grade elevation.

.9 Install warning tape directly above utilities 300 mm below finished grade in landscaped areas and 150 mm below sub grade under pavements and slabs.

3.12 SOIL FILL

.1 Plough, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

.2 Place soil fill on sub-grades free of mud, frost, snow, or ice.

.3 Place and compact fill material in layers to required elevations as follows:

.1 Under grass and planted areas: use satisfactory soil material.

.2 Under walks and pavements: use satisfactory soil material.

.3 Under steps and ramps: use engineered fill.

.4 Under building slabs: use engineered fill.

.5 Under footings and foundations: use engineered fill.

3.13 SOIL MOISTURE CONTROL

.1 Uniformly moisten or aerate sub grade and each subsequent fill or backfill soil layer before compaction to within 2% of optimum moisture content.

.2 Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

.3 Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2% and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

.1 Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

.2 Compact soil materials to not less than 98% Standard Proctor Density to ASTM D698.

.3 Compact areas inaccessible to consolidation by mechanical rollers, and areas within 1500 mm of exterior walls by hand tampers or rollers operated to avoid any damage to existing work.

.4 Sprinkle material with water where necessary to bring to optimum moisture content so that specified density is achieved.

.5 Proof roll sub grade for exterior slabs and paving prior to placing any granular material

3.15 GRADING

.1 Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated, and as follows:

.1 Provide a smooth transition between adjacent existing grades and new grades.

.2 Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

.2 Slope grades to direct water away from buildings and to prevent ponding; finish sub-grades to required elevations within the following tolerances:

.1 Lawn or Unpaved Areas: ±35 mm.

.2 Walks: ±25 mm.

.3 Pavements: ±13 mm.

.3 Finish sub grade on interior of building to a tolerance of 13 mm when tested with a 3 metre straightedge.

3.16 SUBSURFACE DRAINAGE

.1 Coordinate and install subsurface drainage systems if subsurface drainage is indicated for the project.

3.17 SUB-BASE AND BASE COURSES

.1 Place sub-base and base course on sub-grades free of mud, frost, snow, or ice.

.2 Place sub-base and base course under pavements and walks on prepared sub grade as follows:

.3 Install separation geotextile on prepared sub grade in accordance with manufacturer's written instructions, overlapping sides and ends.

.4 Place base course material over sub base course under hot mix asphalt pavement.

.5 Shape sub-base and base course to required crown elevations and cross slope grades.

.6 Place sub-base and base course 150 mm or less in compacted thickness in a single layer.

.7 Place sub-base and base course that exceeds 150 mm in compacted thickness in layers of equal thickness, with no compacted layer more than 150 mm thick or less than 75 mm thick.

.8 Compact sub-base and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98% of maximum dry unit weight in accordance with ASTM D698.

3.18 CAPILLARY BREAK

.1 Place capillary break on sub-grades free of mud, frost, snow, or ice.

.2 On prepared sub-grade, place and compact capillary break under cast in place concrete slabs on grade as follows:

.1 Install geotextile on prepared sub-grade in accordance with manufacturer's written instructions, overlapping sides and ends.

.2 Place capillary break 150 mm or less in compacted thickness in a single layer.

.3 Place capillary break that exceeds 150 mm in compacted thickness in layers of equal thickness, with no compacted layer more than 150 mm thick or less than 75 mm thick.

.4 Compact each layer of capillary break to required cross sections and thicknesses to not less than 95% of maximum dry unit weight in accordance with ASTM D698.

3.19 FIELD QUALITY CONTROL

.1 Notify testing agency to inspect and test sub-grades and each fill or backfill layer; proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

.2 Make compaction tests at following frequencies:

.1 Exterior side of perimeter walls: One test/100 lineal m of compacted lift of backfill.

.2 Within building area under basement and sub-basement floating slabs on grade: one test/1,000 m² of compacted lift of backfill.

.3 Within building area under main floor structural slabs: one test/2,500 m² of compacted lift of backfill.

.4 Under exterior floating concrete slabs: one test/1,000 m² of compacted lift of backfill.

.5 Under exterior structural slabs: one test/2,500 m² of compacted lift of backfill.

.6 Retaining walls: one test/100 lineal m of compacted lift of backfill.

.7 Asphalt pavement sub base: one test/1000 m² of compacted lift of backfill or re-compacted lift of native material.

.8 Asphalt pavement granular base: one test/1000 m² of compacted lift of backfill.

.9 Trenches more than 15 metres in length: 2 density tests per 600 mm of trench depth per 100 m of trench length.

.10 Trenches 15 m or less in length: minimum of 3 density test evenly spaced through the depth and length of trench.

.11 Landscaped areas: One test/2,500 m² of compacted lift of backfill.

.3 Scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and re-test until specified compaction is obtained when testing agency reports that sub-grades, fills, or backfills have not achieved degree of compaction specified

3.20 PROTECTION

.1 Protect newly graded areas from traffic, freezing, and erosion; keep free of trash and debris.

.2 Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

.3 Remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing where settling occurs before Project correction period elapses; restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 RESTORATION

.1 Remove surplus materials and debris, trim slopes, and correct defects noted by Departmental Representative upon completion of work.

.2 Replace topsoil as indicated.

.3 Reinstate pavement, sidewalks, and landscaping to condition and elevation that existed before excavation.

.4 Clean and reinstate areas affected by work as directed by Departmental Representative.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

.1 Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off property in conformance with province of Newfoundland and Labrador requirements.

3.23 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 11 10 – General Requirements: Cleaning.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 10 – General Requirements: Cleaning.

.3 Waste Management: Separate waste materials for reuse and recycling in accordance with Section 01 11 10 – General Requirements: Waste Management and Disposal. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION