

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
3. Section 01 33 00 - Submittal Procedures.
4. Section 32 11 16.01 - Granular Sub-base.

1.2 REFERENCES

1. American Society for Testing and Materials (ASTM)
 1. ASTM D4791 99, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
2. "Ministère des Transports du Québec"
 1. *Cahier des charges et devis généraux* (CCDG), latest edition.

1.3 SAMPLES

1. Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
2. Allow continual sampling by the Departmental Representative during production.
3. Provide the Departmental Representative with access to the supply source and to processed material for sampling.
4. Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Departmental Representative to permit full cross section sampling.
5. Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 WASTE MANAGEMENT AND DISPOSAL

1. Transport unused aggregate materials to a local site approved by the Departmental Representative.

PART 2 - PRODUCT

2.1 MATERIALS

1. Aggregates for the sub-base, the base and shoulders must comply with the requirements of the NQ-2560-114 standard, Part II: Base, Surface Course and Shoulders.
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1. Type MG 20 granular base materials.
2. Type MG 112 granular sub-base materials.
2. Aggregates for pad and coating in accordance with the requirements of NQ-2560 Part III: Pad, Coating, Anti-contamination Layer and Filtration Layer.
 1. Type CG-14 granular material for pad and coating.
3. Aggregates for hot asphalt mix to NQ-2560-114. Part V: Hot Mix Asphalt.
4. The stone dust (2.5 mm-5.0 mm) must be gray in color, consist of hard particles, strong and free from lumps of clay, binder materials, organic materials or frost, and any other deleterious substance. It must come from a local supply source to facilitate eventual purchase should the Owner need to make repairs. Submit samples for approval by the Departmental Representative.
5. In addition to the geotechnical requirements, backfill or materials from borrow pits outside the site and used on site must meet criteria "A" of the MDDELCC's "Politique de protection des sols et de réhabilitation des terrains contaminés" (Quebec government authority on the environment's policy on soil protection and rehabilitation of contaminated sites).

2.2 SOURCE QUALITY CONTROL

1. Inform the Departmental Representative of the proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production.
2. If, in the opinion of the Departmental Representative, materials from the proposed source do not meet, or cannot reasonably be processed to meet the specified requirements, locate an alternative source or demonstrate that the material from the source in question can be processed to meet the specified requirements.
3. Notify the Departmental Representative 4 weeks in advance of the proposed change regarding the material's source.
4. Acceptance of material at the source does not preclude future rejection if it fails to conform to the requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 - EXECUTION

3.1 PREPARATION

1. Handling
 1. Handle and transport aggregates to avoid segregation, contamination and degradation.
 2. Stockpiling
 1. Stockpile aggregates on site in locations as indicated unless directed otherwise by the Departmental Representative.
 2. Stockpile aggregates in sufficient quantities to meet Project schedules.
 3. Stockpiling sites are to be level, well-drained and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
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4. Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.
5. Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
6. Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hrs of rejection.
7. Stockpile materials in uniform layers of thickness as follows:
 - a. Maximum 1.5 m for coarse aggregate and base course materials.
 - b. Maximum 1.5 m for fine aggregate and granular base materials.
 - c. Maximum 1.5 m for other materials.
8. Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
9. Do not cone piles or spill material over edges of piles.
10. Do not use conveying stackers.
11. If Work is performed under winter conditions, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEAN UP

1. Leave aggregate stockpile site in tidy, well-drained condition, free of standing surface water.
2. Leave any unused aggregates in neat compact stockpiles as directed by the Departmental Representative.
3. For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTION

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 35 43 - Environmental Procedures.

1.2 REFERENCES

1. U.S. Environmental Protection Agency (EPA) / Office of Water.
 1. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 DEFINITIONS

1. Clearing consists in cutting trees and brush to not more than specified height above grade, and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
2. Close-cut clearing consists in cutting standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.
3. Clearing isolated trees consists in cutting designated trees to not more than specified height above grade and disposing of felled trees and debris.
4. Underbrush clearing consists in removing undergrowth, deadwood, and trees with trunk diameter smaller than 50 mm from treed areas and disposing of fallen timber and surface debris.
5. Grubbing consists in excavating and disposing of stumps, roots, boulders and rock fragments of specified size to not less than specified depth below existing ground surface.

1.4 SUBMITTALS

1. Submittals in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit certificates signed by the manufacturer certifying that materials comply with specified performance characteristics and physical properties.
3. Submit manufacturer's installation/application instructions.

1.5 QUALITY

1. Comply with construction occupational health and safety regulations in accordance with section 01 35 29.06 - Health and Safety Requirements.
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2. Worker Protection:

1. Workers must wear gloves, dust masks, long-sleeved clothing and eye protection when applying herbicide materials.
2. Workers must not eat, drink or smoke while applying herbicide material.
3. Clean up spills of preservative materials immediately with absorbent material and safely and appropriately discard said material to sanitary landfill.

1.6 STORAGE AND PROTECTION

1. Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, utility lines, site appurtenances, water courses and root systems of trees that are to remain.
 1. Repair damaged items to the satisfaction of the Departmental Representative.
 2. Replace trees designated to remain, if damaged, as directed by the Departmental Representative.

1.7 WASTE MANAGEMENT AND DISPOSAL

1. Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
2. Consider felled timber from which saw logs, pulpwood, posts, poles, ties, or fuel wood can be produced as marketable timber.
 1. Limb and top felled timber and cut into marketable lengths.
 2. Stockpile these materials adjacent to site.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Bituminous-based paint of standard manufacture, specially formulated for tree wounds.
2. Fill Materials
 1. Excavated soil material: Free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, deleterious, or objectionable materials.
 2. Remove and store soil material for reuse.

PART 3 - EXECUTION

3.1 PREPARATION

1. Inspect the site and verify the items designated to remain, particularly the butternut trees, with the Departmental Representative.
 2. Locate and protect utility lines: Preserve active utilities traversing site in operating condition.
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1. Notify the Departmental Representative immediately of damage to utility lines or when unknown existing utility lines are encountered.
2. When utility lines to be removed are encountered within the area of operations, notify the Departmental Representative in ample time to minimize interruption of service.
3. Notify utility authorities before starting clearing and grubbing.
4. Keep roads and sidewalks free of dirt and debris.

3.2 COMPLIANCE

1. Manufacturer's instructions: Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.3 CLEARING

1. Clearing includes felling, trimming, and cutting trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush and rubbish occurring within cleared areas.
2. Clear as directed by the Departmental Representative by cutting at height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.
3. Cut off branches and cut down trees overhanging area cleared, as directed by Departmental Representative.
4. Cut off unsound branches on trees designated to remain, as directed by Departmental Representative.

3.4 GRUBBING

1. Remove and dispose of roots larger than 7.5 cm in diameter, matted roots and designated stumps from indicated grubbing areas.
2. Grub out stumps and roots to not less than 300 mm below ground surface.
3. Grub out visible rock fragments and boulders, greater than 300 mm in greatest dimension, but less than 0.25 m³.
4. Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent surface of ground.

3.5 REMOVAL AND DISPOSAL

1. Transport and dispose of clearing and grubbing debris as indicated by the Departmental Representative.

3.6 FINISHED SURFACE

1. Leave ground surface in condition suitable for stripping of topsoil, for approval by the Departmental Representative.
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3.7 CLEAN UP

1. Clean in accordance with Section 01 74 11 - Cleaning.
2. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTION

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 31 23 33.01 - Excavating, Trenching and Backfilling

1.2 REFERENCES

1. U.S. Environmental Protection Agency (EPA) / Office of Water.
 1. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

PART 2 - PRODUCTS

2.1 NOT USED

1. Not applicable.

PART 3 - EXECUTION

3.1 STRIPPING OF TOPSOIL

1. Ensure that procedures are conducted in accordance with applicable provincial, territorial and municipal requirements.
 2. Remove topsoil before construction procedures commence to avoid compaction of topsoil.
 3. Handle topsoil only when it is dry and warm.
 4. Remove vegetation from targeted areas through non-chemical means and dispose of stripped vegetation through alternative / ecological methods.
 5. Remove brush from targeted areas through non-chemical means and dispose of stripped vegetation through alternative / ecological methods.
 6. Strip topsoil by scraper to depths as indicated by the Departmental Representative. Avoid mixing topsoil with subsoil.
 7. Pile topsoil in berms using a backhoe where indicated by the Departmental Representative.
 1. Berm heights not to exceed 2.5 to 3 m.
 8. Dispose of unused topsoil at the location indicated by the Departmental Representative.
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9. Protect topsoil stockpiles from contamination and compaction.
10. Cover topsoil that has been piled for long term storage with clover or grass to maintain agricultural potential of soil.

3.2 PREPARATION OF GRADE

1. Check that all levels are in accordance with values indicated on the plans. Notify the Departmental Representative if discrepancies occur and do not begin work until instructed by the Departmental Representative.
 1. Grade area only when soil is dry to lessen soil compaction.
 2. Grade soil with scrapers while respecting natural level profiles and eliminate protrusions and low points in order to favor drainage.

3.3 TOPSOIL PLACEMENT

1. Place topsoil only after the Departmental Representative has accepted the specified bed or excavation base.
2. Spread the topsoil with a backhoe under dry conditions, on a bed free of frost and standing water, in even layers not exceeding 150 mm.
3. Establish traffic patterns for equipment to prevent driving on topsoil after it has been spread to avoid compaction.
4. Loosen soil following spreading procedures.

3.4 CLEAN UP

1. Clean in accordance with Section 01 74 11 - Cleaning.
2. Upon completion of installation and verification of performance, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 31 11 00 - Clearing and Grubbing.
3. Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.2 REFERENCES

1. American Society for Testing and Materials (ASTM)
 1. ASTM D698-91 (1998), Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m).

1.3 EXISTING CONDITIONS

1. Refer to geotechnical study report and archaeological report attached to these specifications.
2. Known underground and surface utility lines, as well as other buried structures, are as indicated on the general site plan.
3. Refer to the paragraph about dewatering in Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.4 PROTECTION

1. Protect and/or re-install or re-plant existing fencing, trees, landscaping, natural features, building bench marks, pavement and hard surfaces or underground utility lines that are to remain, as directed by the Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.
2. Maintain access roads to avoid the accumulation of construction-related debris on the roads.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Excavated or graded material may be suitable for use as filling material if they are approved by the Departmental Representative.
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PART 3 - EXECUTION

3.1 GRADING

1. Rough grade while respecting indicated levels, profiles, and contours and allow for surface treatment as indicated.
2. While rough grading, create slope as instructed.
3. Prior to placing filling material, loosen the soil to a depth of 150 mm. Maintain filling material and existing soil at approximately the same moisture content to facilitate bonding.
4. Compact filled and disturbed areas to the maximum dry density determined in accordance with the ASTM D698 standard, i.e.:
 1. 95% under paved and sidewalk areas.
5. Do not disturb the soil under the branches of the trees or shrubs that are to remain in place.

3.2 TESTS

1. Inspection and testing of soil compaction will be carried out by the Laboratory designated by the Departmental Representative. The expense will be paid by the Departmental Representative.

3.3 REMOVAL AND DISPOSAL OF SURPLUS MATERIALS

1. Remove surplus material and material unsuitable for filling, grading or landscaping off site, as directed by the Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 01 35 13.43 - Special project procedures for contaminated sites.

1.2 RELATED WORK INCLUDED IN THIS SECTION

1. This section includes (without being limited to) the following work:
 1. Excavation and backfilling work for all civil engineering structures and landscaping.

1.3 REFERENCES

1. American Society for Testing and Materials International (ASTM).
 1. ASTM C117 04, Standard Test Method for Material Finer than 0,075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 2. ASTM C136 05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 3. ASTM D422 63 2002, Standard Test Method for Particle Size Analysis of Soils.
 4. ASTM D698 00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft lbf/ft) (600 kN m/m).
 5. ASTM D1557 02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft lbf/ft) (2,700 kN m/m).
 6. ASTM D4318 05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 2. Canadian General Standards Board (CGSB)
 1. CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 2. CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
 3. Canadian Standards Association, (CSA International)
 1. CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - a. CAN/CSA-A3001-03, Cementitious Materials for Use in Concrete.
 2. CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete
 4. U.S. Environmental Protection Agency (EPA)/Office of Water
 1. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
 5. Bureau de normalisation du Québec (BNQ)
 1. NQ 1809-300 – Latest edition.
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1.4 DEFINITIONS

1. Excavation classes: Two classes of excavation are recognized; common excavation and rock excavation.
 1. Rock excavation: Solid material in excess of 1.00 m³ that cannot be removed by means of heavy duty mechanical excavating equipment with a 0.95 to 1.15 m³ bucket. Frozen material is not classified as rock.
 2. Common excavation: Excavation material of any nature that is not included in the definition of rock excavation.
2. Unclassified excavation: Excavation of deposits of any nature encountered during work.
3. Topsoil
 1. Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 2. Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable materials larger than 25 millimeters.
4. Waste material: Surplus or excavated material unsuitable for use in Work.
5. Borrow material: Material obtained from locations outside of the area to be graded but required for construction of fill areas or for other portions of Work.
6. Recycled filling material: Material considered inert and obtained from other sources and engineered to meet the requirements of the fill areas.
7. Unshrinkable filling materials: Very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.5 SUBMITTALS (DOCUMENTS AND SAMPLES)

1. Verify and validate the location of underground utilities. Produce a location plan of existing utilities as found in field, including clearance records from the utility authority, as well as a location plan of relocated and abandoned services, as required.
2. Samples
 1. Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 2. At least three weeks prior to beginning backfilling Work, inform the Departmental Representative of the proposed source of filling materials and provide access for sampling.

1.6 HEALTH AND SAFETY

1. Implement necessary construction occupational health and safety measures in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.7 WASTE MANAGEMENT AND DISPOSAL

1. Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
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2. Transport excess aggregate materials that can be reused to a local, authorized site. Obtain necessary permits and authorizations necessary beforehand, and notify the Departmental Representative.

1.8 EXISTING CONDITIONS

1. Refer to the geotechnical study report and archaeological report attached to the project specifications.
 2. Buried services:
 1. Before beginning Work, verify the location of buried services on and adjacent to site.
 2. Arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work. Pay the costs of relocating the services.
 3. Remove and dispose of obsolete buried services and cap cut-offs.
 4. Size, depth and location of existing utilities and structures as indicated for informational purposes only. Completeness and accuracy are not guaranteed.
 5. Prior to beginning excavation Work, establish the location and condition of buried utilities and structures, and notify the Departmental Representative of the findings. Provide and apply measures necessary to prevent interruption of service during Work.
 6. Confirm locations of buried utilities through careful test excavations.
 7. Maintain and protect identified water, sewer, gas, electric, telephone and other utilities and structures from damage, as indicated.
 8. Where utility lines or structures exist in area of excavation, obtain appropriate instructions from Departmental Representative before performing work.
 9. Record location of maintained, re-routed and abandoned underground lines, and submit this information to the Departmental Representative.
 10. Confirm locations of recent excavations adjacent to area of excavation.
 3. Existing surface features
 1. Conduct, with the Departmental Representative, condition surveys of trees and other plants, lawns, fencing, service poles, wires, pavement, boundary markers and bench marks that could be affected by the Work.
 2. Protect existing buildings and surface features from damage while Work is in progress. In event of damage, repair immediately as directed by the Departmental Representative.
 3. Where required for excavation, cut roots or branches as directed by the Departmental Representative.
 4. Unearthed underground elements
 1. If materials such as archaeological remains or any other substance likely to be defined as such are unearthed during excavation, the later must be interrupted to allow appropriate inspection measures. In addition, the Departmental Representative must be informed immediately. Work must not resume until further written instructions is received regarding from the Departmental Representative.
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PART 2 - PRODUCTS

2.1 MATERIALS

1. Type 1 and Type 2 filling material: Properties as described in Section 31 05 16 - Aggregate Materials.
2. In addition to geotechnical requirements, backfill materials or borrowed materials used on site must satisfy the generic criterion "A" of the MDDELCC's "Politique sur la protection des sols et la réhabilitation des sols contaminés" (Quebec government authority on the environment's policy on soil protection and the rehabilitation of contaminated sites).
3. Type 3 filling material: Selected material from excavation or other sources approved by the Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.
4. Geotextiles: Refer to Section 31 32 19.01 - Geotextiles.

PART 3 - EXECUTION

3.1 PREPARATIONS

1. Remove obstructions, ice and snow from surfaces to be excavated within excavation area.
2. Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
3. Around buildings, remove the asphalt and/or concrete slab prior to excavating.
4. When working next to buildings, take all necessary precautions prior to excavating to avoid underpinning structures or works that could affect the stability of the foundations in place.

3.2 PREPARATION / PROTECTION

1. Protect existing features in accordance with applicable local regulations.
 2. Keep excavations clean, free of standing water, and loose soil.
 3. Where soil is subject to significant volume change due to change in moisture content, cover and protect to the satisfaction of the Departmental Representative.
 4. Protect the natural and man-made features that are to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
 5. Protect buried services that are to remain undisturbed.
 6. For excavation inside the building, provide special equipment that will not damage the building or induce deleterious vibrations.
 7. Take all necessary precautions prior to excavating to avoid work underpinning structures or works that could affect the stability of the foundations in place.
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3.3 STRIPPING OF TOPSOIL

1. In accordance with Section 31 14 13 - Stripping and Stockpiling Soil.

3.4 STOCKPILING

1. Granular material in accordance with Section 31 05 16 - Aggregate Materials.

3.5 DEWATERING AND HEAVE PROTECTION

1. Keep excavations free of water while Work is in progress.
2. Provide the Departmental Representative with details of proposed dewatering or heave prevention methods, for review.
3. Avoid excavation below groundwater table if soil boiling or heave is likely to occur.
 1. Prevent bottom heave of excavations or piping heave by lowering groundwater, cutting off sheet piles or through other means.
4. Protect open excavations against flooding and damage due to surface run-off.
5. Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved runoff areas and in a manner not detrimental to public and private property, or portion of Work completed or under construction.
 1. Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.6 EXCAVATING

1. Notify the Departmental Representative at least seven days in advance of excavation operations so that initial soil cross-sections can be determined.
 2. Before beginning excavation work, read the geotechnical report that describes the nature of the soil on site, more specifically rock dip, in order to prevent the ground from becoming unstable. Provide a supporting system for trenches, if needed. Limit depth of excavation to that which is required to perform the Work.
 3. Before beginning excavation Work, the Contractor to present the Departmental Representative with excavation drawings that have been stamped and signed by a geotechnical engineer who is a member of the "Ordre des ingénieurs du Québec".
 4. Excavate to lines, grades, elevations and dimensions as indicated by the Departmental Representative.
 5. During excavation, remove structures in accordance with Section 02 41 13 - Selective Site Demolition.
 6. Excavation must not interfere with the bearing capacity of adjacent foundations.
 7. Do not disturb soil under the branches of trees or shrubs that are to remain.
 1. If excavating through roots, excavate by hand and cut roots with a well sharpened axe or saw.
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8. For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench prior to the installation of elements to be buried. In addition, do not leave more than 15 m of open trench at the end of the work day.
9. Keep excavated and stockpiled materials at a safe distance away from the edge of the trench, as directed by the Departmental Representative.
10. Restrict construction machinery operations next to open trenches.
11. Dispose of surplus and unsuitable excavated material at the approved location.
12. Do not obstruct runoff or natural watercourses.
13. Bottom grades must be level and consist of undisturbed soil, and be free of loose, soft or organic matter.
14. Notify the Departmental Representative when the bottom grade is reached.
15. Completed excavation must be approved by the Departmental Representative.
16. Remove unsuitable materials from trench bottom, including those that extend below required elevations to extent and depth as directed by the Departmental Representative.
17. Correct unauthorized over-excavation as follows:
 1. Fill with Type 2 filling material compacted to not less than 95% of corrected Standard Proctor maximum dry density.
18. Hand trim the excavation, strengthen the excavation walls and remove loose material and debris from excavations.
 1. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
 2. Clean out rock seams and fill with concrete mortar or grout to the satisfaction of the Departmental Representative.
19. Install geotextiles in accordance with Section 31 32 19.01 - Geotextiles.

3.7 FILL TYPE AND COMPACTION

1. Use types of filling material as indicated or specified below. Compaction densities are percentages of maximum densities obtained from the ASTM D698 and ASTM D1557 standards.
 1. Place unshrinkable fill in areas as indicated.
 2. The grain size of the filling material and its placement must be validated by the materials control laboratory.

3.8 BEDDING AND COVERING OF UNDERGROUND SERVICES

1. Place and compact granular material for the bedding and covering of underground services as indicated and specified in Section 33 41 00 – Sewer Pipes.
 2. Bedding and covering materials must not be frozen when placed.
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3.9 TRANSITIONS

1. Make transitions between the undisturbed soil and filling material wherever backfilling was required under a carriage way (parking, driveway, etc.), a roadway or shoulder. In all cases, the excavation walls must be sloped in accordance with the most stringent of the following: CSST requirements or the transitions specified in this section.
2. When backfilling materials are of the same quality (frost resistance, mechanical property, etc.) that the undisturbed soil of the walls of the excavation (eg : Materials from the excavating), execute transitions realizing slope walls 1H: 1V starting from the infrastructure line to a depth of 2100 mm from the road surface (frozen depth).
3. When the quality (frost resistance, mechanical properties, etc.) of the filling materials and the undisturbed soil of the excavation walls is different, make the following transitions based on the position of the excavation versus the axis of the roadway. In addition, when reusing the material in place where the undisturbed soil of the excavation walls consists of two (2) or more layers of various quality, make the following transitions if the reused materials are not placed in the original order and position:
 1. Where excavation walls are longitudinal in relation to the surface, make transitions with slopes 3H: 1V starting from the infrastructure line up to a depth of 2100 mm from the road surface (soil freezing depth).
 2. Where the excavation walls are transversal in relation with the surface, make transitions with slopes 5H: 1V starting from the infrastructure line up to a depth of 2100 mm from the road surface (soil freezing depth).
4. Where filling material was place around a fixed structure (manhole, catch basin, etc.), make transitions with slopes 3H: 1V starting from the infrastructure line up to a depth of 2100 mm from the road surface (soil freezing depth).

3.10 CRUSHED STONE FOR BEDDING

1. To ensure a stable base when ground conditions are poor and/or where there is water, use clean 20 mm crushed stone and a geotextile membrane for bedding as follows:
 1. If the material of the trench below bed level is rock, cover the surface of the bed with a geotextile membrane.
 2. If the material of the trench below bed level consists of material other than rock, completely cover the base of clean crushed stone with a geotextile membrane.
 3. Spread, level and compact the clean crushed stone by mechanical means in such a way as to avoid settling.

3.11 BACKFILLING

1. Do not proceed with backfilling until:
 1. The Departmental Representative has inspected the site and approved installation.
 2. The Departmental Representative has inspected the site and approved the work below the finish grade.
 3. Inspection, testing, approval, and recording of underground utilities.
 4. The removal of shoring equipment and braces and the backfilling of voids with satisfactory soil material.
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2. Areas to be backfilled are to be free of debris, snow, ice, water and frozen ground.
3. The use of backfill material which is frozen or contains ice, snow or debris is prohibited.
4. Backfilling around structures:
 1. Place bedding and surround material as specified elsewhere.
 2. Place layers of filling material simultaneously on both sides of installed structures in order to balance the loads.
5. Backfill up to the infrastructure line in accordance with the specifications of the CCDG – Latest edition and BNQ 1809-300 – Latest edition.

3.12 RESTORATION

1. Upon completion of Work, remove waste materials and debris in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by the Departmental Representative.
2. Replace the topsoil as indicated or as directed by the Departmental Representative.
3. Restore lawns to the elevation prior to excavation.
4. Clean and restore the areas affected by the Work as directed by the Departmental Representative.
5. Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION CONTENT

1. This section lists the requirements for the supply and installation of geotextiles used for the construction of protection structures, filtration, drainage structures, retaining wall structures, and roadbeds, the purpose of which is to:
 1. Separate and prevent the mixing of granular materials of different sizes.
 2. Act as hydraulic filters permitting the passage of water while retaining the strength of granular soil structures.

1.2 MEASUREMENT AND PAYMENT

1. Geotextiles will not be measured for payment. They will be included in pricing for various articles.

1.3 RELATED SECTIONS

1. Section 01 33 00 - Submittal Procedures.
2. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
3. Section 31 23 33.01 - Excavating, Trenching and Backfilling.
4. Section 31 37 00 - Rip-Rap.

1.4 REFERENCES

1. American Society for Testing and Materials International, (ASTM)
 1. ASTM D4491-99a, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 2. ASTM D4595-86 (2001), Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 3. ASTM D4716-01, Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 4. ASTM D4751-99a, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 2. Canadian General Standards Board (CGSB)
 1. CAN/CGSB-4.2 No. 11.2, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 2. CAN/CGSB-148.1, Methods of Testing Geosynthetics - (Complete Set).
 - a. No.2, Methods of Testing Geosynthetics - Mass per Unit Area.
 - b. No.3, Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - c. No.6.1, Methods of Testing Geotextiles and Geomembranes – Bursting Strength of Geotextiles Under No Compressive Load.
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- d. No.7.3-, Methods of Testing Geotextiles and Geomembranes – Grab Tensile Test for Geotextiles.
 - e. No. 10, Methods of Testing Geosynthetics - Geotextiles – Filtration Opening Size.
- 3. International Canadian Standards Association (CSA International)
 - 1. CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - 2. CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - 4. Ministère des Transports du Québec
 - 1. Tome VII Ouvrage d'art, Chapter 13, Geotextiles.

1.5 SUBMITTALS

- 1. Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- 2. Submit to Departmental Representative the following samples at least three weeks prior to beginning Work.
 - 1. Minimum length of 2 m of roll width of geotextile.

1.6 DELIVERY, STORAGE AND HANDLING

- 1. During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dust, debris and rodents.

1.7 WASTE MANAGEMENT AND DISPOSAL

- 1. Remove all packaging materials from the site and dispose of them at appropriate recycling facilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- 1. Membrane of non-woven, needle punched synthetic fibers consisting of polypropylene or polyester. The geotextile must be rot-proof, insensitive to the action of acids and bases and unalterable by micro-organisms and insects.
 - 2. Each roll must be identified and display, among others, the manufacturer's name, the type of membrane and its size, surface mass and mechanical properties.
 - 3. The membrane must meet the requirements of Standard 13101, tome VII, of the Ministère des Transports du Québec.
 - 4. The sewing thread is made of polyester, gauge 250 dtex.
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PART 3 - EXECUTION

3.1 PLACEMENT

1. Unroll the aligned geotextile on a level surface in the manner and location indicated.
2. Place the geotextile material so that the surface is smooth and free of tension stress, folds, wrinkles and creases.
3. Place geotextile material on sloping surfaces in continuous lengths from the toe of the slope to the upper extent of the geotextile.
4. Overlap each successive strip of geotextile 600 mm over the previously laid strip.
5. Protect installed geotextile material from displacement, damage or deterioration before, during and after the placement of material layers.
6. Replace damaged or deteriorated geotextile at the satisfaction of the Departmental Representative.
7. Do not backfill until the Departmental Representative has approved of the geotextile.

3.2 CLEAN UP

1. Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

1. Vehicular traffic directly on geotextiles is not permitted.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. The works listed in this division are included for information purposes only and are not exhaustive. The list does not exclude the works described in other divisions of the specifications, shown in the drawings or necessary for the completion of the work as described in the plans.
2. Section 31 23 33.01 – Excavating, trenching and Backfilling.
3. Section 31 32 19.01 – Geotextiles.

1.2 REFERENCES

1. American Society for Testing and Materials (ASTM)
 1. ASTM C 144-[99], Standard Specification for Aggregate for Masonry Mortar.
 2. ASTM C 618-[00], Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
2. Canadian Standards Association (CSA)
 1. CAN/CSA-A23.1-[00], Concrete Materials and Methods of Concrete Construction.
 2. CAN/CSA-A3000-[98], Cementations Materials Compendium.
3. Ministère des Transports du Québec - Cahier des charges et devis généraux (CCDG) – Latest edition

1.3 WASTE MANAGEMENT AND DISPOSAL

1. Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 STONE

1. All imported materials must come from authorized sites as per the “Règlement sur les carrières et sablières” (regulation on quarries and sand pits).
 2. The stones must come from a quarry, be hard, dense, angular, durable, free of cracks and other defects. The bulk density should not be less than 2.6. The stone will not contain frost-susceptible materials (e.g. shale, schist, slate, phyllite, argillaceous limestone, dolomite, clay, argillaceous sandstone, mudrock), nor will there be weak areas (e.g. presence of microlites that may cause fragmentation).
 3. Stone characteristics must meet the requirements of the 14501 standard, Tome VII of the “Ministère des Transports du Québec’s publication entitled “Ouvrages routiers”.
 4. Stone characteristics must be in accordance with the 14501 standard of the “Ministère des Transports du Québec”.
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5. The largest stones should not exceed 1.5 times the average of the two other sizes (avoid flat stones).
6. Stone sizes are indicated on the plans. The material should contain 50% of stone with a diameter greater than the average of the minimum and maximum particle sizes.

2.2 GEOTEXTILE FILTER

1. Geotextile: in accordance with section 31 32 19.01 - Geotextiles.

PART 3 - EXECUTION

3.1 PLACING

1. Where rip-rap is to be placed on slopes, excavate a trench at toe of slope (size as indicated).
2. Where rip-rap is to be installed, prepare a fine grade area to create an even flat surface. Fill the depressions with suitable material and compact to create a firm bed.
3. Place the geotextile on the prepared surface in accordance with the provisions of Section 31 32 19.01 - Geotextiles and as indicated. Avoid puncturing the geotextile. Vehicular traffic on the geotextile is not permitted.
4. Place rip-rap to the thickness and details indicated.
5. Place the stone as approved by Departmental Representative to obtain a hard surface and a stable mass. Place the largest stones at bottom of the slopes.
 1. Use the largest stones for the foundations and headers.
 2. Stagger the vertical joints and fill the voids with rock spalls or cobble stone.
 3. Finish surface so that it is even, flat, free of large holes and neat in appearance.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

1. Section 05 12 23 – Structural Steel for Buildings.

1.2 MEASUREMENT PROCEDURES

1. Non applicable.

1.3 REFERENCES

1. Canadian Standards Association (CSA International)
 1. CSA-G40.20/G40.21-2004, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 2. CSA W47.1-03, Certification of Companies for Fusion Welding of Steel Structures.
 3. CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
 4. CSA W59-03, Welded Steel Construction (Metal Arc Welding) (metric version).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

1. Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
2. Product data : submit manufacturer's printed product literature, specifications and datasheet.
3. Submit shop drawings and indicate : piles, calipers, bolts and tips.
 1. Each drawing stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
4. Quality Assurance : test reports:
 1. Certificates : submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
5. Submit details of pile stock material to be used.

1.5 DELIVERY, STORAGE AND HANDLING

1. Deliver, store and handle materials in accordance with manufacturer's written instructions.
 2. Deliver new, undamaged materials to site, accompanied by certified test reports.
 3. Storage and Protection:
 1. Store and handle pipe piling in accordance with manufacturer's written instructions to prevent permanent deflection, distortion or damage to interlocks.
 2. Support pipe piling on level blocks or racks spaced not more than [3] m apart and not more than [0.60] m from ends.
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3. Store pipe piling to facilitate required inspection activities and prevent damage to coatings and corrosion prior to installation.
4. Waste Management and Disposal :
 1. Separate waste materials for recycling in accordance with Section 01 74 21 – Construction / Demolition Waste Management and Disposal.
 2. Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
 3. Divert unused concrete materials from landfill to local facility as approved by Departmental Representative.
 4. Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Departmental Representative.
 5. Unused paint material must not be disposed of into sewer system, into streams, lakes, onto ground or in any other location where it will pose a health or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Steel pipe : seamless, of sizes and wall thicknesses indicated, plain.
 2. Pipe material to have following minimum properties :
 1. Yield strength : 350 MPa.
 3. Pipe chemical composition : to CSA-Z245.1 ASTM A 252.
 4. Pipe allowable tolerances :
 1. Deviation from straight line, specified diameter, wall thickness and out-of-roundness on body of pipe and at pipe ends to conform to API SPEC 5L.
 2. Pipe to be checked for deviations before leaving mill.
 5. Pile tip reinforcement : to CSA-G40.20/G40.21, Grade 300.
 6. Splices : to CSA-G40.20/G40.21, Grade 300.
 7. Welding electrodes : to CSA W48 series.
 8. Concrete : in accordance with Section 03 30 00 - Cast-in-Place Concrete.
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PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

1. Compliance : comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 FABRICATION

1. Fabricate full length piles to eliminate splicing during installation wherever possible.
2. Full length piles may be fabricated from piling material by splicing lengths together.
 1. Use splices as indicated.
3. Submit details of planned use of pile material stock to Departmental Representative for approval prior to start of fabrication. Re-use cut-off lengths as directed by Departmental Representative.
4. Allowable tolerance on axial alignment to be 0,25 %.
5. Repair defective welds as approved by Departmental Representative :
 1. Repairs : to CSA W59.
 2. Unauthorized weld repairs may be rejected.

3.3 PAINTING AND COATING

1. Non applicable.

3.4 INSTALLATION

1. Install piling.
 2. Splice piles in place during installation, if required, by welding.
 3. Perform internal visual inspection of steel pipe, joints and base prior to placing of concrete.
 1. Ensure pipe inside is free from foreign matter.
 4. Install concrete in accordance with Section 03 30 00 - Cast-in-Place Concrete.
 5. Fill steel pipe pile with concrete using methods to limit free fall and to prevent segregation. Ensure adequate vibration to completely fill cross section of pipe.
 1. Ensure adequate vibration to completely fill cross section of pipe.
 6. Install driving shoes as part of field work.
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3.5 WELDING

1. Weld to CSA W59.
2. Welding certification of companies: to CSA W47.1.

3.6 VERIFICATION OF PILES

1. A minimum of two (2) piles should be tested under loads indicated in plans. The verification procedure shall meet the requirements of ASTM D1143-81 standard or latest edition.
2. In the event that a stake would fail the test, further testing would be required on another pile under the supervision of the Ministry Representative.
3. Provide a complete piles report to the Departmental Representative after piles work. In this report, the following informations should be provided: depth sinking, anchor load, type of pile. The report should be signed by a professional engineer member of the OIQ. He will have to be on site during the test.

3.7 PILES LOAD

1. Total maximal service load : 44 kN.
2. Load sinking : 88 kN.

END OF SECTION
