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**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 32 11 16.01 – Granular Sub-base.
- .2        Section 32 11 23 – Aggregate Base Course
- .3        Section 32 12 16 – Asphalt Paving

**1.2                REFERENCES**

- .1        New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
  - .1        NBDTI Standard Specification Item 201 - Production of Highway Aggregates

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Samples:
  - .1        Allow continual sampling by Departmental Representative during production.
  - .2        Provide Departmental Representative with access to source and processed material for sampling.
  - .3        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.
  - .4        Provide front end loader or other suitable equipment including trained operator for stockpile sampling as necessary.
  - .5        Provide area for Departmental Representative lab trailer and make necessary provisions for water and electric power for the duration of the work.

**Part 2            Products**

**2.1                MATERIALS**

- .1        Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2        Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
  - .1        Screenings produced in crushing of quarried rock.
- .3        Coarse aggregates satisfying requirements of applicable section to be produced from crushed rock.

## **2.2 SOURCE QUALITY CONTROL**

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 2 weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise Departmental Representative 2 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Aggregate source preparation:
  - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.
  - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
  - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
  - .4 When excavation is completed dress sides of excavation to nominal [1.5:1] slope, and provide drains or ditches as required to prevent surface standing water.
  - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
  - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .2 Processing:
  - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .3 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .4 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .5 Stockpiling:
  - .1 Stockpile aggregates in accordance with the requirements of NBDTI Standard Specifications, Item 201.4.5.
  - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
  - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

- .4 Do not use intermixed or contaminated materials.
- .5 Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
- .6 Aggregate acceptance shall be based on sampling and testing in accordance with the requirements of NBDTI Standard Specifications, Item 201.4.6.
- .7 Handling of aggregates produced outside the specified limits and the aggregate rejection criteria shall be in accordance with the requirements of NBDTI Standard Specifications, Item 201.4.7.

### **3.2 CLEANING**

- .1 Leave Work area clean at end of each day.
- .2 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .3 Unused aggregates are the property of the Contractor.

**END OF SECTION**

**Part 1            General**

**1.1                STANDARD**

- .1        All work of this section shall comply with the requirements of the most recent version of the NBDTI Standard Specifications Items 101 and 102, except as amended herein.

**1.2                REFERENCES**

- .1        New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
  - .1        NBDTI Standard Specification Item 101 – Clearing.
  - .2        NBDTI Standard Specification Item 102 – Grubbing.

**Part 2            Execution**

**2.1                GENERAL**

- .1        Prior to clearing operation, tree to be salvaged will be identified by the Departmental Representative.
- .2        As per the requirements of the most recent version of the NBDTI Standard Specification Items 101 and 102, and in conformance with the Contract Documents.
- .3        Bullpens are not to be located within Kouchibouguac National Park.
- .4        In cut sections, and in fill sections where the Subgrade is within 2.5 m of the original ground, grubbing shall be carried out to a width of 1.5 m from the clearing line or as otherwise directed by the Departmental Representative.
- .5        Mobilization and demobilization for this project shall be considered incidental to the Work.

**2.2                REMOVAL AND DISPOSAL**

- .1        Cleared and grubbed materials less than 75mm in diameter shall be chipped and spread evenly as mulch to thickness not greater than 75mm as approved.
- .2        Cut timber greater than 75 mm diameter to 2400 mm lengths and stockpile as directed by Departmental Representative. Stockpiled timber becomes property of Kouchibouguac National Park.
- .3        Mature pine greater than 200 mm diameter shall not be cut without the approval of the Departmental Representative.

**END OF SECTION**

**Part 1 General**

**1.1 STANDARD**

- .1 All work of this section shall comply with the requirements of the most recent version of the NBDTI Standard Specification Item 106, except as amended herein.

**1.2 REFERENCES**

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version)
  - .1 NBDTI Specification Item 106 – Common Excavation

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, sediment and erosion control drawings and sediment and erosion control plan, specific to site, that complies with the requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**3.2 STRIPPING OF TOPSOIL**

- .1 Ensure that procedures are conducted in accordance with applicable Provincial 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 by non-chemical means and dispose of stripped vegetation as directed by Departmental Representative.
- .5 Remove brush from targeted area by non-chemical means and dispose of as directed by Departmental Representative.

- .6 Strip topsoil by scraper to depths as directed by Departmental Representative
  - .1 Avoid mixing topsoil with subsoil.
- .7 Pile topsoil by mechanical hoe in berms in locations as directed by Departmental Representative.
  - .1 Stockpile height not to exceed 2.5 - 3 m.
- .8 Dispose of unused topsoil in location as indicated by Departmental Representative.
- .9 Protect stockpiles from contamination and compaction.
- .10 Cover topsoil that has been piled for long term storage, with trefoil or grass to maintain agricultural potential of soil.

### **3.3 PREPARATION OF GRADE**

- .1 Verify that grades are correct and notify Departmental Representative if discrepancies occur do not begin work until instructed by Departmental Representative.
  - .1 Grade area only when soil is dry to lessen soil compaction.
  - .2 Grade soil with scrapers establishing natural contours and eliminating uneven areas and low spots, ensuring positive drainage.

### **3.4 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On 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 SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 56 00 - Environmental Protection.
- .3 Section 02 41 23 - Selective Site Demolition.
- .4 Section 31 05 17 - Aggregate Materials.
- .5 Section 33 42 13 – Pipe Culverts

**1.2 GENERAL REQUIREMENTS**

- .1 The Work under this section shall include the supply of labour, supervision, materials, equipment, and transportation necessary to complete excavation and backfill as shown on the Contract Drawings, per the Specifications, and as directed by the Departmental Representative, complete in every respect.
- .2 Generally, the Work includes but is not necessarily limited to the following:
  - .1 Foundation excavations.
  - .2 Dewatering.
  - .3 Backfilling of select materials.
  - .4 Compacting fill materials.
  - .5 Removal from site all excavated materials except for material required for backfilling and grading.

**1.3 MEASUREMENT PROCEDURES**

- .1 Work performed under this Section will be incidental to Work in other Sections.

**1.4 REFERENCES**

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
  - .1 NBDTI Standard Specification Item 106 – Common Excavation
  - .2 NBDTI Standard Specification Item 161 – Foundation Excavation
    - .1 Delete
      - .1 161.4.8.3
      - .2 161.6.2
    - .2 Excavation limit as shown on the Plans.
  - .3 NBDTI Standard Specification Item 166 – Backfilling Around Structures
    - .1 Backfilling limits as shown on the Plans.
  - .4 NBDTI Standard Specification Item 167 – Backfill For Structures
  - .5 NBDTI Standard Specification Item 936 - Compaction

## 1.5 DEFINITIONS

- .1 Excavation class: one class of excavation will be recognized; common excavation.
  - .1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .4 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136 : Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
    - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45
  - .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

## 1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control:
  - .1 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
  - .2 Submit to Departmental Representative written notice when bottom of excavation is reached.
- .3 Preconstruction Submittals:
  - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
  - .2 Submit records of underground utility locates, indicating: clearance record from utility authority.
- .4 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Inform Departmental Representative at least 2 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.



- .3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
- .4 Ship samples prepaid to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

## **1.7 QUALITY ASSURANCE**

- .1 Health and Safety Requirements:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

## **1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert excess materials from landfill to local facility for reuse as directed by Departmental Representative.

## **1.9 EXISTING CONDITIONS**

- .1 Examine soil report available in attached appendix. .
- .2 Buried services:
  - .1 Before commencing work establish location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
  - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .5 Prior to beginning excavation Work, notify applicable Departmental Representative and authorities having jurisdiction establish location and state of use of buried utilities and structures. Departmental Representative to clearly mark such locations to prevent disturbance during Work.
  - .6 Confirm locations of buried utilities by careful test excavations.
  - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
  - .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing. Costs for such Work to be paid by Departmental Representative.
  - .9 Record location of maintained, re-routed and abandoned underground lines.
  - .10 Confirm locations of recent excavations adjacent to area of excavation.
- .3 Existing buildings and surface features:
  - .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.

- .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
- .3 Where required for excavation, cut roots or branches as directed by Departmental Representative in accordance with Section 31 11 00 – Clearing and Grubbing .

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Backfill material: refer to Section 31 05 16 – Aggregate Materials and NBDTI Standard Specifications Item 167 – Backfill for Structures.
- .2 Borrow material: refer to Section 31 23 11 – Borrow.

## **Part 3 Execution**

### **3.1 SITE PREPARATION**

- .1 Remove obstructions from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02 41 13 - Selective Site Demolition.

### **3.2 PREPARATION/PROTECTION**

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .4 Protect buried services that are required to remain undisturbed.

### **3.3 STOCKPILING**

- .1 Stockpile fill materials in areas designated by Departmental Representative.
  - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

### **3.4 COFFERDAMS, SHORING, BRACING AND UNDERPINNING**

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29.06 - Health and Safety Requirements and Health and Safety Act for the Province of New Brunswick.

- .1 Where conditions are unstable, Departmental Representative to verify and advise methods.
- .2 Obtain permit from authority having jurisdiction for temporary diversion of water course.
- .3 Construct temporary Works to depths, heights and locations as directed by Departmental Representative.
- .4 During backfill operation:
  - .1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.
  - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
  - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.
- .5 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .6 Upon completion of substructure construction:
  - .1 Remove cofferdams, shoring and bracing.
  - .2 Remove excess materials from site and restore watercourses as directed by Departmental Representative.

### **3.5 DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative's review and approval details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
  - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or 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 and in 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.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

### **3.6 EXCAVATION**

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

- .2 Excavate to lines, grades, elevations and dimensions as directed by Departmental Representative.
- .3 Remove obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Do not disturb soil within branch spread of trees or shrubs that are to remain.
  - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .6 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .7 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .8 Restrict vehicle operations directly adjacent to open trenches.
- .9 Dispose of surplus and unsuitable excavated material as directed by the Departmental Representative.
- .10 Do not obstruct flow of surface drainage or natural watercourses.
- .11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .12 Notify Departmental Representative when bottom of excavation is reached.
- .13 Obtain Departmental Representative approval of completed excavation.
- .14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .15 Correct unauthorized over-excavation as follows:
  - .1 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density in accordance with NBDTI Standard Specification Item 936 - Compaction.
- .16 Hand trim, make firm 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.

### 3.7 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
  - .1 Departmental Representative has inspected and approved installations.
  - .2 Departmental Representative has inspected and approved of construction below finish grade.
  - .3 Inspection, testing, approval, and recording location of underground utilities.
  - .4 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
  - .1 Place bedding and surround material as specified elsewhere.
  - .2 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 300mm.

### **3.8 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Replace topsoil as directed by Departmental Representative.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate roadbed disturbed by excavation to thickness, structure and elevation which existed before excavation with aggregate material.
- .5 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END OF SECTION**

**Part 1 General**

**1.1 STANDARD**

- .1 All work of this section shall comply with the requirement of the most recent version of the NBDTI Standard Specification Items 106, 107, 116, 121 and 936, except as amended herein.

**1.2 REFERENCES**

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
  - .1 NBDTI Standard Specification Item 106 – Common Excavation
  - .2 NBDTI Standard Specification Item 107 – Unclassified Excavation
  - .3 NBDTI Standard Specification Item 116 – Ditching
    - .1 Add
      - .1 116.4.1.1 - Ditching shall be performed at locations as directed by the Engineer.
  - .4 NBDTI Standard Specification Item 121 – Borrow
  - .5 NBDTI Standard Specification Item 936 – Compaction

**Part 2 Products**

**2.1 MATERIALS**

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
  - .1 NBDTI Standard Specification Item 121 – Borrow

**Part 3 Execution**

**3.1 GENERAL**

- .1 As per the requirements of the most recent version of the NBDTI Standard Specification Items 106, 107, 116, 121 and 936, and in conformance with the Contract Documents.

**END OF SECTION**

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**Part 1            General**

**1.1               STANDARD**

- .1       All work of this section shall comply with the requirements of the most recent version of the NBDTI Standard Specifications Items 608 and 611, except as amended herein.

**1.2               REFERENCES**

- .1       New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
- .1       NBDTI Standard Specification Item 608 – Random Riprap.
  - .2       NBDTI Standard Specification Item 611 – Individual Rock Placement.

**Part 2            Products**

**2.1               MATERIAL**

- .1       All riprap R-5, R-25 and individual rocks shall be supplied by the Contractor in accordance with NBDTI Standard Specification Items 608 and 611 and in conformance with the Contract Documents.

**Part 3            Execution**

**3.1               GENERAL**

- .1       As per the requirements of the most recent version of the NBDTI Standard Specifications Items 608 and 611 and in conformance with the Contract Documents.

**END OF SECTION**