**RETAINED SOIL SYSTEM, TRUE ABUTMENT, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM, FALSE ABUTMENT, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, HIGH PERFORMANCE, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, MEDIUM PERFORMANCE, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, LOW PERFORMANCE, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, HIGH PERFORMANCE, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, MEDIUM PERFORMANCE, PRECAST FABRICATION - Item No.**

**RETAINED SOIL SYSTEM, TRUE ABUTMENT, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM, FALSE ABUTMENT, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, HIGH PERFORMANCE, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, MEDIUM PERFORMANCE, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, LOW PERFORMANCE, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, HIGH PERFORMANCE, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, MEDIUM PERFORMANCE, PRECAST DELIVERY - Item No.**

**RETAINED SOIL SYSTEM, TRUE ABUTMENT, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM, FALSE ABUTMENT, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, HIGH PERFORMANCE, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, MEDIUM PERFORMANCE, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM, WALL/SLOPE, LOW PERFORMANCE, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, HIGH PERFORMANCE, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, MEDIUM PERFORMANCE, INSTALLATION - Item No.**

**RETAINED SOIL SYSTEM, ROADBASE EMBANKMENT, INSTALLATION - Item No.**

**BACKFILL FOR RETAINED SOIL SYSTEM, ULTRA LIGHTWEIGHT - Item No.**

**BACKFILL FOR RETAINED SOIL SYSTEM, LIGHTWEIGHT - Item No.**

**BACKFILL FOR RETAINED SOIL SYSTEM, HIGH PERFORMANCE - Item No.**

**BACKFILL FOR RETAINED SOIL SYSTEM, MEDIUM PERFORMANCE - Item No.**

**BACKFILL FOR RETAINED SOIL SYSTEM, LOW PERFORMANCE - Item No.**

|  |
| --- |
| Special Provision No. 599S22 October 26, 2022 |

**CONSTRUCTION SPECIAL PROVISION FOR RETAINED SOIL SYSTEMS (RSS)**

**1.0 SCOPE**

This Special Provision covers the requirements for the design and construction of retained soil systems (RSS) walls and steep slopes.

Additional requirements for RSS precast concrete facing elements shall be as specified in the Contract Documents.

**2.0 REFERENCES**

This Special Provision refers to the following standards, specifications, or publications:

**Ontario Provincial Standard Specifications, Construction**

OPSS 501 Compacting

**Ontario Ministry of Transportation Publications**

MTO Designated Sources of Materials (DSM)

MTO Structural Manual

Qualification Criteria for RSS

MTO Forms:

PH-CC-822 Certificate of Conformance

**CSA Standards**

S6-19 Canadian Highway Bridge Design Code (CHBDC)

**3.0 DEFINITIONS**

For the purposes of this Special Provision the following definitions apply:

**Alignment Elements** means components specified by the manufacturer that are constructed on the foundation for RSS to facilitate placing of the facing elements to the correct lines and grades, such as concrete levelling pads and soldier piles.

**Approved Product Drawings** means the documentation for an RSS that has been submitted by the manufacturer and accepted by the Ministry for listing in the ministry’s DSM, according to the Qualification Criteria for RSS.

**Backfill for RSS** means the material specified by the manufacturer as part of the engineered materials comprising the backfill for the RSS.

**Constructed Height** means the vertical distance between the top of the foundation for RSS and the top of the currently placed and compacted backfill for RSS, measured at the point of the design height.

**Corrective Work** means work carried out by the Contractor to repair deficiencies identified by the Owner during the RSS warranty period.

**Design Checking Engineer** means the Engineer retained by the Contractor who checks the original design and Working Drawings.

**Design Engineer** means the Engineer retained by the Contractor who produces the original design and Working Drawings.

**Design Height** means the maximum difference in elevation between the foundation for RSS and the corresponding top of backfill for RSS, over the full length or perimeter of the RSS.

**External Stability** means stability against sliding, overturning, and eccentricity failures of the RSS.

**Facing Elements** means components specified by the manufacturer that delineate the front face of the RSS and to which reinforcing elements may be attached, such as precast concrete panels, split-face concrete blocks, wire mesh, and geosynthetic panels or layers.

**Foundation for RSS** means the base on which the RSS is constructed, such as excavation to a specified elevation and construction of a granular pad.

**Global Stability** means external stability against deep-seated and compound failure of the RSS, including adequate bearing capacity at specified settlements of the foundation.

**Internal Stability** means stability against failures within the reinforced soil mass and facing system of the RSS, including adequate resistance against connection, rupture, pull-out, and excessive elongation of the reinforcing elements.

**Lot** means all precast RSS elements from one structure, from a single RSS supplier, of the same concrete mix design. The maximum lot size shall be 500 m² of vertical face of the RSS.

**Manufacturer** means the firm who supplies the design and proprietary components, and who specifies the backfill and other materials, for the RSS.

**Manufacturer’s Representative** means an individual with continuous full-time employment with the manufacturer for a period of at least three years, and who is knowledgeable in the design and construction of the RSS.

**Mechanically Stabilized Earth** (MSE) means an earth retaining system with the ground behind the facing elements internally stabilized with metallic, polymeric or geosynthetic reinforcing elements.

**Obstruction** means any part of the work and any existing condition within the Working Area that affects the design, construction, and performance of the RSS, such as structures, catch basins and manholes, drainage pipes and sewers, and utilities.

**Performance Tolerance - Local** means the joint gap between any two constructed facing elements, measured at any point along the joint between the facing elements and perpendicular to the line of the joint.

**Performance Tolerance - Global** means the vector distance between any point on the constructed RSS and the corresponding point on the theoretical RSS surface as specified in the Contract Documents.

**Placing Tolerances** means tolerances specified by the manufacturer on the placing of the RSS components and backfill for RSS to ensure compliance of the constructed RSS with the performance tolerances. Placing tolerances include lateral and vertical displacements that occur during erection of the RSS.

**Reinforcing Elements** means components specified by the manufacturer that are placed within the backfill for RSS and connected to the facing elements to mechanically stabilize the backfill for RSS, such as metal tie strips, metal grids and geosynthetic grids.

**Retained Soil System (RSS)** means a proprietary system listed in the ministry’s DSM used to retain horizontal loads for applications such as true and false abutment structures, retaining walls and steep slopes; or, to retain vertical loads for applications such as embankments over soft ground. RSS includes mechanically stabilized earth (MSE).

**RSS Superintendent** means the Contractor’s authorized representative in charge of the construction of the RSS.

**Structure** means any bridge, culvert, tunnel, retaining wall, overhead sign, high mast light pole, wharf, dock, or any part thereof.

**4.0 DESIGN AND SUBMISSION REQUIREMENTS**

**4.01 Design Requirements**

**4.01.01 General**

The RSS shall be designed according to the approved product drawings, CSA S6, MTO Structural Manual, and the Contract Documents.

The geometric requirements of the RSS, such as lines and grades of the facing elements and typical cross-sections, shall be as specified in the Contract Documents.

The foundation for RSS shall be as specified in the Contract Documents.

**4.01.02 RSS Selection**

A RSS shall be selected from the ministry’s DSM that meets the application, performance and appearance requirements for that RSS, as specified in the Contract Documents.

A RSS shall be selected from the ministry’s DSM designated as either ‘A’ (Accepted) or ‘DE’ (Demonstration). RSS designated as ‘DE’ status requires inspection, instrumentation and monitoring of the constructed RSS, and the reporting of the findings to the Ministry by the manufacturer as specified in the Qualification Criteria for RSS.

When there is more than one RSS included in the same tender item number for payment, all RSS for the tender item shall be selected from the same ministry’s DSM including type and colour of facing elements.

All RSS that abut an existing structure, or a structure to be constructed as part of the Work, and that have the same performance and appearance requirements, shall be selected from the same ministry’s DSM, including type and colour of facing elements.

**4.01.03 Obstruction**

Design details of the RSS shall be provided for all obstructions as specified in the Contract Documents. Where an obstruction exists but is not located to sufficient accuracy for the design of the RSS, the obstruction shall be located in the field to sufficient accuracy as required to design the RSS.

**4.01.04 Foundation Investigation Report**

A foundation investigation report that describes the subsurface conditions at the RSS is available, as specified in the Contract Documents.

The Owner warrants the data in the foundation investigation report, except that interpretations of the data and opinions expressed in the foundation investigation report are not warranted.

**4.02 Submission Requirements**

**4.02.01 Working Drawings**

At least 14 Days prior to commencement of construction of the RSS, three sets of Working Drawings shall be submitted to the Contract Administrator for information purposes. A separate submission of Working Drawings shall be made for each RSS in the Contract. All submissions shall bear the seal and signature of the design Engineer and the design checking Engineer.

The RSS superintendent shall always have a copy of the Working Drawings on site during the construction of the RSS.

The Working Drawings shall include as a minimum the following information:

a) Statement from the manufacturer confirming the experience and expertise of the design Engineer and design checking Engineer to provide design services for the manufacturer’s RSS;

b) All design, fabrication and construction drawings and specifications for the RSS;

c) Location and value of the design height of the RSS;

d) Defined lines and grades of reinforced volume, length of reinforcing elements, and type of backfill for RSS;

e) Details at obstructions, and connections to other structures, as specified in the Contract Documents;

f) Statement of contact pressure at the interface between the RSS backfill and foundation for comparison to the bearing resistance required by the RSS foundation according to CSA-S6 and the Contract Documents;

g) Statement of satisfactory internal and external stability;

h) Joint gaps for concrete facing elements;

1. Placing tolerances for the RSS; and
2. Inspection and testing details during construction.

**4.02.02 RSS Superintendent**

At least 14 Days prior to commencement of construction of the RSS, the name(s) of the RSS superintendent responsible for each RSS in the Contract shall be submitted in writing to the Contract Administrator.

During construction of an RSS, the RSS superintendent shall not change without written permission from the Contract Administrator. A request for a change in the RSS superintendent shall be submitted at least 1 week prior to the actual change in RSS superintendent.

**4.02.03 Manufacturer’s Representative**

At least 14 Days prior to commencement of construction of the RSS, the name(s) of the manufacturer’s representative for each RSS shall be submitted in writing to the Contract Administrator.

The Contract Administrator shall be notified in writing 48 hours prior to each site visit by the manufacturer’s representative. The advance notice shall include the dates and locations the manufacturer’s representative will be on site.

**4.02.04 Inspection Report**

For each RSS, an inspection report shall be submitted to the Contract Administrator following an inspection by the Contractor’s Engineer, after each of the following milestones, and prior to commencement of subsequent operations on that RSS:

a) Layout and marking of all lines and grades needed to construct the RSS; and construction of the alignment elements, where applicable;

b) Delivery and storage on site of facing elements and reinforcing elements, where applicable; and

c) Installation of the facing elements, placement and compaction of the backfill for RSS, and installation of the reinforcing elements, where applicable.

The Contractor’s Engineer shall be knowledgeable in the design and construction of the manufacturer’s RSS.  The Contractor’s Engineer shall have demonstrated experience and expertise to certify that the RSS work is in general conformance with the Contract Documents and Working Drawings and to issue Inspection Reports and Certificates of Conformance.

Where the design height of the RSS is greater than 5.0 m, the inspection report shall document inspections at the constructed height of the RSS at 5.0 m, 10.0 m, and 15.0 m, as applicable, up to and including the design height.

The inspections and inspection reports in no way supersede the inspection and testing intervals required for the construction of the RSS, as specified in the Working Drawings.

**5.0 MATERIALS**

**5.01 General**

All materials for the selected RSS shall be according to the approved product drawings for that RSS.

**5.02** **Precast Concrete Elements**

The RSS precast concrete elements, including panels for facing elements, finishing caps, corner elements and other element types shall be as specified in the Contract Documents.

**6.0 EQUIPMENT**

**6.01 Vehicles**

Skid-steer, tired, and tracked vehicles shall not be permitted on any area where the depth of backfill for RSS over installed reinforcing elements is less than 0.3 m. Construction vehicles shall not be permitted to be in direct contact with installed reinforcing elements at any time.

**7.0 CONSTRUCTION**

**7.01 General**

The RSS shall be constructed according to the Working Drawings and this specification.

**7.02 RSS Superintendent**

The construction of the RSS shall be scheduled such that it is at all times under the responsible charge of the RSS superintendent. The RSS superintendent shall be advised on site by the RSS manufacturer’s representative as to the required procedures for the construction of the RSS, for the specified operations and time periods.

**7.03 Manufacturer’s Representative**

The manufacturer’s representative shall be on site to oversee installation of the RSS and to advise the RSS superintendent of the procedures and placing tolerances required for the construction of the RSS according to the manufacturer’s requirements as approved on the ministry’s DSM.

For each RSS item number, the manufacturer’s representative shall be on site at commencement of the RSS construction for a time period of 3 Working Days to observe the following operations, where applicable:

1. Layout of the RSS and construction of the alignment elements;
2. Installation of the facing elements; and
3. Placement and compaction of the backfill for RSS and installation of the reinforcing elements.

Whenever there is a change in the RSS superintendent during construction of the RSS, the manufacturer’s representative shall return to the site to advise the new RSS superintendent of the procedures and placing tolerances required for the construction of the RSS according to the manufacturer’s requirements as approved on the ministry’s DSM.

**7.04 Certificates of Conformance - Foundation**

A MTO Form PH-CC-822, Certificate of Conformance for the foundation of the RSS shall be submitted to the Contract Administrator prior to the construction of the RSS.

**7.05 Backfill for RSS**

Backfill for RSS and placement of reinforcement elements shall be placed within the lines and grades shown on the Working Drawings. All backfill for RSS shall be compacted according to OPSS 501.

Unless otherwise specified in the Contract Documents, backfill for RSS shall not be placed against an adjacent concrete structure that is part of the work until the concrete in that structure has obtained at least 70% of the compressive strength specified in the Contract Documents.

**7.06 Performance Tolerances**

Performance tolerances for the RSS shall be according to Table 1.

**7.07 Certificates of Conformance**

A MTO Form PH-CC-822, Certificate of Conformance, upon completion of each RSS, shall be submitted to the Contract Administrator.

**7.08 Corrective Work**

**7.08.01 General**

All deficiencies shall be repaired according to the repair procedures for corrective work. All corrective work shall be done within the RSS warranty period, unless prevented by seasonal shutdown, in which case the corrective work shall be done prior to June 30 of the following year.

At least one week prior to commencement of any corrective work, written notice of commencement of work shall be submitted to the Contract Administrator and the Owner.

Access to the corrective work shall be provided for inspection by the Owner when requested.

**7.08.02 Repair Procedures**

Three copies of repair procedures for corrective work shall be submitted to the Contract Administrator 14 Days prior to commencement of any corrective work.

The repair procedures shall include a description of the cause and fully detail the corrective work required to correct the deficiencies identified by the Owner.

The repair procedures shall bear the seal and signature of an Engineer and be signed by the manufacturer’s representative.

**7.09 RSS Warranty**

The warranty period shall be 36 months from the date of the Contract Completion Certificate.

**7.10 Management of Excess Materials**

Management of excess materials shall be according to the Contract Documents.

**8.0 QUALITY ASSURANCE**

**8.01 Acceptance of RSS**

**8.01.01 End of RSS Construction**

The Contract Administrator shall inspect the work to determine if the completed RSS has any deficiencies identified in Table 2. If the RSS contains any of the deficiencies listed in Table 2, the RSS shall be deemed rejectable.

**8.01.02 End of the RSS Warranty Period**

The Owner shall accept the RSS at the end of the RSS warranty period if none of the deficiencies listed in Table 2 are found during the warranty inspections. The RSS shall not be accepted until all deficiencies have been repaired by corrective work.

**8.02 Warranty Inspections**

Throughout the warranty period the Owner will carry out warranty inspections of the RSS for deficiencies according to Table 2. The Owner will notify the Contractor as to the date and time of the inspection(s) and the Contractor may, at his discretion, be present during the inspection(s).

Within two weeks following a warranty inspection the Owner will notify the Contractor in writing of all deficiencies that require corrective work.

**9.0 MEASUREMENT FOR PAYMENT**

**9.01 Actual Measurement**

**9.01.01 Retained Soil System, True Abutment, Precast Fabrication - Item**

 **Retained Soil System, False Abutment, Precast Fabrication- Item**

 **Retained Soil System, Wall/Slope, High Performance, Precast Fabrication - Item**

 **Retained Soil System, Wall/Slope, Medium Performance, Precast Fabrication - Item**

 **Retained Soil System, Wall/Slope, Low Performance, Precast Fabrication - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, High Performance, Precast Fabrication - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, Medium Performance, Precast Fabrication - Item**

Measurement shall be by area in square metres of precast concrete elements.

**9.01.02 Backfill for Retained Soil System, Ultra Lightweight**

 **Backfill for Retained Soil System, Lightweight**

 **Backfill for Retained Soil System, High Performance**

 **Backfill for Retained Soil System, Medium Performance**

 **Backfill for Retained Soil System, Low Performance**

Measurement shall be of the mass in tonnes of the material placed within the theoretical lines and grades shown in the stamped Working Drawings. The method of determining the mass shall be as specified in the Contract Documents.

**9.02 Plan Quantity Measurement**

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clause under Actual Measurement.

**10.0 BASIS OF PAYMENT**

**10.01 Retained Soil System, True Abutment, Precast Fabrication - Item**

 **Retained Soil System, False Abutment, Precast Fabrication- Item**

 **Retained Soil System, Wall/Slope, High Performance, Precast Fabrication - Item**

 **Retained Soil System, Wall/Slope, Medium Performance, Precast Fabrication - Item**

 **Retained Soil System, Wall/Slope, Low Performance, Precast Fabrication - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, High Performance, Precast Fabrication - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, Medium Performance, Precast Fabrication - Item**

**10.01.01 General**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work, subject to payment adjustments.

Corrective work, including investigation of defects and deficiencies, design of repairs, site access, traffic staging and removal of existing work, shall be at no additional cost to the Owner, except where the defects and deficiencies are not the fault of the Contractor.

Unacceptable lots shall be rejected and replaced, except when the Contract Administrator permits an unacceptable lot to remain in the Work with a payment adjustment.

**10.01.02 Payment Adjustment**

**10.01.02.01 Payment Adjustment for Air Void System in Hardened Concrete**

Payment for an unacceptable lot represented by the core shall be calculated according to the following:

Payment reduction for a lot = (Lot quantity/tender quantity) × Price × [(100 - P)/100]

Where:

Lot quantity = RSS front face area in a lot (m²) (calculated based on plan dimension)

Tender quantity = RSS front face area in tender (m²) (calculated based on plan dimension)

Price = Contract price for the RSS precast fabrication tender item

P = pay factor for the lot according to the spacing factor specified below:

|  |  |
| --- | --- |
| **Spacing Factor, mm** | **Pay Factor** |
| > 0.200 and ≤ 0.220 | 90 |
| > 0.220 and ≤ 0.240 | 80 |
| > 0.240 and ≤ 0.250 | 70 |

**10.01.02.02 Payment Adjustment for Rapid Chloride Permeability**

The payment adjustment for concrete without silica fume shall be calculated based on individual lots and applied as follows:

Payment Adjustment = Lot quantity × (C-2500)/5

Where:

Payment Adjustment = payment adjustment of a lot ($)

C = rapid chloride permeability of a lot (coulombs)

Lot Quantity = volume of concrete in a lot (m³) (calculated based on plan dimension)

The payment adjustment for concrete containing silica fume shall be calculated based on individual lots and applied as follows:

Payment Adjustment = Lot quantity × (C-1000)/5

Where:

Payment Adjustment = payment adjustment of a Lot containing silica fume ($)

C = rapid chloride permeability of a lot (coulombs)

Lot Quantity = volume of concrete in a lot (m³) (calculated based on plan dimension)

**10.01.02.03 Payment Adjustment for Salt Scaling Resistance**

Payment for an unacceptable lot represented by the slab shall be calculated according to the following:

Payment reduction for a lot = (Lot quantity/tender quantity) × Price × [(100 - P)/100]

Where:

Lot quantity = RSS front face area in a lot (m²) (calculated based on plan dimension)

Tender quantity = RSS front face area in tender (m²) (calculated based on plan dimension)

Price = Contract price for the RSS precast fabrication tender item

P = pay factor for the lot according to the average cumulative mass loss specified below:

|  |  |
| --- | --- |
| **Average Cumulative Mass Loss, kg/m²** | **Pay Factor** |
| >0.8 and ≤ 1.0 | 75 |
| >1.0 and ≤ 1.2 | 50 |

**10.02 Retained Soil System, True Abutment, Precast Delivery - Item**

 **Retained Soil System, False Abutment, Precast Delivery - Item**

 **Retained Soil System, Wall/Slope, High Performance, Precast Delivery - Item**

 **Retained Soil System, Wall/Slope, Medium Performance, Precast Delivery - Item**

 **Retained Soil System, Wall/Slope, Low Performance, Precast Delivery - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, High Performance, Precast Delivery - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, Medium Performance, Precast Delivery - Item**

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment, and Material to do the work.

**10.03** **Retained Soil System, True Abutment, Installation - Item**

 **Retained Soil System, False Abutment, Installation - Item**

 **Retained Soil System, Wall/Slope, High Performance, Installation - Item**

 **Retained Soil System, Wall/Slope, Medium Performance, Installation - Item**

 **Retained Soil System, Wall/Slope, Low Performance, Installation - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, High Performance, Installation - Item**

 **Retained Soil System with Finishing Cap, Wall/Slope, Medium Performance, Installation - Item**

 **Retained Soil System, Roadbase Embankment, Installation - Item**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment and Material to do the work, including all costs associated with having the manufacturer’s representative on site.

Payment for construction of the foundation for RSS shall be made under the appropriate tender items in the Contract.

Corrective work, including investigation of defects and deficiencies, design of repairs, site access, traffic staging and removal of existing work, shall be at no additional cost to the Owner, except where the defects and deficiencies are not the fault of the Contractor.

**10.04 Backfill for Retained Soil System, Ultra Lightweight - Item**

 **Backfill for Retained Soil System, Lightweight - Item**

 **Backfill for Retained Soil System, High Performance - Item**

 **Backfill for Retained Soil System, Medium Performance - Item**

 **Backfill for Retained Soil System, Low Performance - Item**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment and Material to do the work.

When the Contract does not contain a separate tender item for backfill for RSS, the Contract price for the RSS Contract items in which the backfill for RSS is incorporated shall include full compensation for all labour, Equipment and Material required to place and compact the backfill for RSS.

**TABLE 1**

**Performance Tolerances for RSS**

|  |  |
| --- | --- |
| **Performance****Requirement** | **Performance Tolerance (mm)** |
| **Local** | **Global** |
| Abutments | Joint Gap ± 5 (Note 1) | £ 20 |
| High | Joint Gap ± 10 (Note 1) | £ 30 |
| Medium | N/A | £ 50 |
| Low | N/A | £ 100 |
| Notes:1. Joint Gap shall be as specified on the Working Drawings. |

**TABLE 2**

**RSS Deficiencies**

|  |  |
| --- | --- |
| **Number** | **Description of Deficiency** |
| 1 | Performance tolerance exceeds tolerances given in Table 1. |
| 2 | Damaged or deficient facing elements, and damaged or deficient alignment elements, including elements exhibiting scaling, delaminations, and cracks. |
| 3 | Dead and dying vegetative elements that are an integral part of the RSS. |

WARRANT: Always with these tender items.