

The Brampton Standard Specifications are Amendments to the following noted OPSS.

OPSS	BSS	
OPSS.MUNI 310	BSS 310	Construction Specification for Hot Mix Asphalt
OPSS 351	BSS 351	Construction Specification for Concrete Sidewalk
OPSS.MUNI 353	BSS 353	Construction Specification for Concrete Curb and Gutter Systems
OPSS.MUNI 410	BSS 410	Construction Specification for Pipe Sewer Installation in Open Cut
OPSS.MUNI 421	BSS 421	Construction Specification for Pipe Culvert Installation in Open Cut
OPSS.MUNI 510	BSS 510	Construction Specification for Removals
OPSS 802	BSS 802	Construction Specification for Topsoil
OPSS 803	BSS 803	Construction Specification for Sodding
OPSS.MUNI 1010	BSS 1010	Material Specification for Aggregates – Base, Subbase, Select Subgrade and Backfill Materials
OPSS 1150	BSS 1150	Material Specification for Hot Mix Asphalt
OPSS.MUNI 1350	BSS1350	Material Specification for Concrete Materials and Product

BSS 310 CONSTRUCTION SPECIFICATION FOR HOT MIX ASPHALT (Revision April 27, 2018)

Clause **OPSS.MUNI 310.08.01** of OPSS.MUNI 310 is amended by deleting it and replacing it with the following:

Asphalt Cement Content

Where the asphalt cement content is found to be in the borderline range of table 7, OPSS.MUNI 310, the payment for asphalt will be reduced by 1% for each 0.01% asphalt cement content deviation up to 20% price reduction for 0.20% deviation. Beyond the acceptable borderline range identified in OPSS.MUNI 310 Table 7, the asphalt shall be removed and replaced at the contractor’s cost.

The asphalt area or mass placed that will be subject to asphalt cement content deficiency cost adjustments or rejection based on sample test results (A.C. content deficiency) will be governed by the following for each session/day:

1. For first sample of session/day, from asphalt paved since beginning of session/day to 50% asphalt paved to next sampling point.
2. For sample taken at a point, from 50% asphalt paved since last sampling point to 50% asphalt paved to next sampling point.
3. For last sample of session/day, from 50% asphalt paved since second last sampling point to end of session/day.

Testing frequency shall be as per OPSS.MUNI 310 Table 6

Prior to a paving operation, the Contract Administrator shall review the scope of that paving operation with the Contractor in determining the session/day.

Should any test result fail, the area associated with the test shall not be paid for unless the Contractor has:

- a) approved the cost adjustment, or
- b) replaced the deficient area.

Should the Contractor require retesting of a sample, any costs associated with the delay in obtaining a second test result shall be the Contractors.

The initial test and retest will be averaged to determine the cost adjustment or rejection factor. Should an independent 3rd party take a test from the sample, the 3rd party's result shall be the sole result used in determining cost adjustment or removal. The cost of this 2nd and 3rd test of the sample shall be at the expense of the Contractor if the results are within 0.10% of the original.

ASPHALT TRIAL BATCH

After the Contract Administrator's approval of the submitted asphalt mix design, the Contractor shall at least 5 working days prior to asphalt paving, provide a trial batch of the asphalt type proposed for placement, to allow for compliance tests of the Marshall properties. Where there is non-compliance, the Contractor shall provide further trial batches for further tests. No asphalt shall be placed on the construction site without confirmation by the Contract Administrator that trial batch compliance has been attained and **no claim** shall be entertained as a result of the submitted trial batches failing to meet specifications and which may affect the Contractor's schedule/operations. The cost of the provision of trial batch shall be included in the unit price bid for the asphalt items. The Contractor shall also bear the costs of any additional trial batches as well as the costs for additional laboratory mix compliance checks other than the initial compliance check.

A trial batch is required for each asphalt type used. When there is an interval of more than 4 weeks between applications of asphalt (same type), the Contract Administrator reserves the right to request another trial batch for compliance check and this shall be at the Contractor's cost.

At the time of paving, the Contractor shall allow a City representative to be present at the asphalt plant to oversee the manufacture of the asphalt mix.

Clause **OPSS.MUNI 310.08.01** of OPSS.MUNI 310 is amended by the addition of the following section:

Payment shall be based on the unit tendered price per meter square and shall include the supply of all materials (including asphalt cement), mixing, transporting, placing, and

rolling the asphalt. The Contractor shall account for applicable OPS Standards, and the grade control, as required per the contract documents, in the unit tender price. The City shall not make any additional payment for overrun of asphalt quantity. The contractor shall also include in the unit price for placing of HL1 by method of echelon paving. In addition to the standard paving equipments, the tender price shall include minimum additional equipments (as required) are as follows:

- i) Shuttle Buggy(ies)
- ii) Asphalt Paving Machine(s)
- iii) Roller(s).

The equipments as noted above must meet industry standards or better. At the pre-pave meeting the contractor must submit a list of all equipments. Omission of equipment not on the equipment list will not relive the contractor of its responsibility.

**BSS 351 CONSTRUCTION SPECIFICATION FOR CONCRETE SIDEWALK
(Revision Jan 10, 2016)**

Clause **OPSS 351.07.9** of OPSS 351 is amended by addition of the following:

The Tactile Walking Surface Indicators shall be installed in accordance with City standard drawings 280, 281, 282, 283 and 284 and shall be made of cast iron, according to CSA B651-2012 and follow Ontario Regulation 191/11.

Sidewalk accessibility ramps shall be according to City standard drawing 280, 281, 282, 283 and 284 with tactile walking surface indicators and shall be incorporated at every location with a pedestrian crossing or as specified in the Contract Documents.

All plates shall be pre-manufactured and delivered to a site with no field modification allowed.

Clause **OPSS 351.09.01.02** of OPSS 351 is amended by deleting it and replacing it with the following:

Measurement of the above tender item shall be the installed area in square meters of tactile walking surface indicator.

Payment at the Contract Price for the above item shall be full compensation for all labour, Equipment and Material to do the work including 150 mm concrete base.

BSS 353 CONSTRUCTION SPECIFICATION FOR CONCRETE CURB AND GUTTER SYSTEMS (Revision April 27, 2018)

Amendments to OPSS.MUNI 353 by the addition of the following section:

As per **City Standard Dwg No. 313 – Catch basin Adjustment** , four (4) 450 mm long, 15M smooth dowels are to be placed in the catch basin sections. Dowels shall be Grade 160 Isophthalic Polyester fibreglass reinforced bars or steel complete with a 100 mm long, 19 mm inside diameter plastic dowel cap containing a compressible non-absorptive, closed cell polyethylene foam cap inserted in the closed end and installed on one (1) end of each dowel to allow for horizontal thermal expansion.

In the case of the curb placed by machine extrusion, joints shall be provided by saw cutting at 6 meter intervals within 6 hours of placing curb. The saw cut shall be to a depth of 50mm across the exposed faces of curb. A full depth saw cut or bituminous fibre expansion joint shall be required every 18 meters. Saw cuts in driveways shall be avoided.

ALL curb installation shall include the additional 50mm width for any current or future 150 mm thick sidewalk/kill strip support.

Clause OPSS.MUNI 353.07.04 of OPSS.MUNI 353 is amended by the addition of the following:

Reinforcement shall be placed in dropped curb for industrial/commercial entrances and at transit ramps. Two 15M reinforcing bars placed at a height of 50 mm above the bottom of the curb and gutter.

BSS 410 CONSTRUCTION SPECIFICATION FOR PIPE SEWER INSTALLATION IN OPEN CUT (Revision July 2, 2013)

Clause **OPSS.MUNI 410.05.01.01** of OPSS.MUNI 410 is amended by deleting it and replacing it with the following:

The Contractor shall note that all storm sewer pipe shall be **concrete pipe**. All storm sewers shall use Bedding Stone as per City Standard Drawing 348 unless otherwise noted. Gradation requirements for bedding materials shall be Bedding Stone as per City Standard Drawing 348.

Clause **OPSS.MUNI 410.07.11** of OPSS.MUNI 410 is amended by deleting it and replacing it with the following:

Storm sewers which are under the traveled portion of the roadway shall be entirely backfilled with Granular 'B' material to road base sub grade elevation compacted in

layers not exceeding 0.2 metres compacted thickness at 100% Standard Proctor Density. Sewers which are not under the traveled portion of the roadway, (from 1.2 meters behind the curb to edge of trench) may be backfilled with suitable native material excavated from the trenches provided no rocks or boulders greater than 100mm diameter are used. Such backfill shall be placed after placing and compacting Granular "B" material to 0.6m above the pipe and shall be compacted in layers not exceeding 0.2 metres in compacted thickness to 95% S.P.D.

The specified Granular 'B' backfill in the pipe trench shall be included in the pipe Items and all roadway Granular 'B', Granular 'A' and Asphalt restoration required above the proposed subgrade are to be paid as per their respective items.

The Contractor shall note that the unit tender price per linear metre for storm sewers shall also include the cost of the following items associated with the storm sewer work:

- Excavation of test holes to verify the elevation of watermain and other underground utility services, as required.
- Any necessary shoring.
- De-watering of the trench.

Where required, breaking into, connection and re-benching of existing appurtenances.

Reinstatement of the top of trench to ensure safe, smooth and dust free traffic conditions shall be carried out immediately, and maintained until full road construction is complete. Flushing and/or cleaning of the lines after placing of asphalt and prior to **Preliminary Acceptance Inspection**.

Clause **OPSS.MUNI 410.10.01** shall also be amended by the addition of the following:

The tender unit price per linear metre of storm sewers, as measured from centre of existing maintenance hole, or centre of new maintenance hole to center of new maintenance hole, or outside face of headwall, shall include excavation and disposal of excavated material, bedding, pipe, installation, connections to existing appurtenances, re benching of existing structures, granular backfill, compaction, and any other labour, equipment, and materials, necessary to complete the work.

Amendments to **OPSS.MUNI 410** shall also be amended by the addition of the following:

All Maintenance Hole Drop Structure installed shall be paid as an each item. Payment at the contract price shall be full compensation for supplying all materials, labour and equipment required to construct these units complete, in accordance with the manufacturer specifications and the pertinent OPSD listed.

Amendments to **OPSS.MUNI 410** shall also be amended by the addition of the following..

The Contractor shall note that an alternate PVC sewer pipe can be used for a catch basin lead where the minimum cover is not less than 1.2 metres and the length of the lead is less than 10 meters. The Contractor shall be responsible to select the appropriate pipe alternative in accordance with OPSS 1841. Supplier must be approved by the City. Pipe material shall be the same size and of equivalent strength as outlined in the contract drawings. At the unit price bid, the Contractor shall supply and install all the necessary fittings (i.e. manhole and catch basins adapters are required when using PVC pipe). The Contractor shall note that the road profile given on the drawings is the centerline of the road and not necessarily the finished trench grade.

If a pipe alternative selected by contractor is inappropriate, the City reserves the right to require the Contractor to change the selection according to the minimum cover criteria and the O.P.S.S. at no additional cost to the City.

BSS 421 CONSTRUCTION SPECIFICATION FOR PIPE CULVERT INSTALLATION IN OPEN CUT (Revision July 2, 2013)

Subsection **OPSS.MUNI 421.09** of OPSS.MUNI 421 shall also be amended by the addition of the following:

Payment for the pipe culvert in metres shall also include the cost of supply, placement, and compaction of bedding, backfill material, and existing pavement as specified.

Subsection **OPSS.MUNI 421.10** of OPSS.MUNI 421 shall also be amended by the addition of the following:

Payment for the pipe culvert in metres shall also include the cost of supply, placement, and compaction of bedding, backfill material, and existing pavement as specified.

BSS 510 CONSTRUCTION SPECIFICATION FOR REMOVAL (Revision April 27, 2018)

Clause **OPSS.MUNI 510.07.01.03** shall also be amended by the addition of the following:

All items that are determined to be removed, salvaged and delivered to the City of Brampton shall be delivered to either the Works Yard at 425 Chrysler Drive or Sandalwood Yard at 120 Sandalwood Parkway.

OPSS.MUNI 510 shall also include the following:

Relocate Mailboxes item shall include the removal of existing mailbox, maintain temporary location, and permanent installation of the post and the boxes placed off the

travelled road, in accordance with the requirements of the Canada Post for offset and height. Payment shall be included in the unit tender price.

The basis for payment for temporary relocation of mailboxes shall include all material, equipment, and labour necessary to supply and install mailboxes as directed and set at 1.07 meters above grade to allow Canada Post mail delivery during the road construction period. Each mailbox shall have house numbers affixed to each side and may be mounted in a group on one (1) common timber. In the event that Canada Post supplies a group box, then the existing mailboxes will be left with the homeowner. For any questions or concerns regarding the relocation or final locations of any mailbox can be discussed with the Canada Post representative Chrisopher Fearon (905) 206-1247 ext.2027.

BSS 802 CONSTRUCTION SPECIFICATION FOR TOPSOIL (Revision April 27, 2018)

Clause **OPSS 802.05.01** of OPSS 802 is amended by the deleting the first paragraph and replacing it with the following:

The use of existing native topsoil is acceptable, provided it meets the same requirements or is amended as per the requirements listed in these specifications. Imported topsoil supplied by the Contractor will be friable, neither heavy clay nor of very light sandy nature consisting of the following, within 5% +/- : 45% sand, 35% silt, 20% clay and pH of 6.2 to 7.6.

All Topsoil to be free of subsoil, roots, vegetation, debris, toxic materials, stones over 25 mm diameter, containing four percent (4%) minimum organic matter for clay loams and two percent (2%) minimum organic matter for sandy loams and must be capable of sustaining vigorous plant growth.

The source from which the topsoil is imported is subject to the City's approval prior to delivery to the site/placement (based on the certificate provided by the supplier confirming compliance with the specifications). The Contractor will be required to arrange for testing (Contractor, Landscape Architect Sub Consultant and the City of Brampton Representatives shall carry out joint sampling per methodology below), after placement of imported topsoil on site and provide topsoil test results to the Contract Administrator and City of Brampton Representatives within seven (7) days of placement of the topsoil. No additional payment will be paid to the Contractor for testing/rejection of imported topsoil.

Testing of Topsoil

All topsoil whether existing or imported to be used in this contract must be tested separately for sod and / or seed, trees, planting beds etc. by an Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) accredited commercial lab.

The Contractor shall test topsoil at pre-agreed frequency with the Contract Administrator, Landscape Architect Sub Consultant and the City of Brampton Representatives present for:

- a) Particle size analysis (percentage of sand, silt and clay by Hydrometer Method).
- b) Organic matter, phosphorus (sodium bicarb), potassium, magnesium, calcium, soil pH, buffer pH, percent base saturation and calculated CEC. (Cation Exchange Capacity)
- c) Sulphur, Zinc, Manganese, Iron, Copper, Boron and soluble salts content, and Atrazine.

Joint Sampling Procedure

The contractor shall arrange for testing of all topsoil placed on site. The Contractor is to notify the Contract Administrator, Landscape Architect Sub Consultant and City of Brampton Representative prior to obtaining the sample(s). The Contractor shall submit two (2) copies of the report to confirm sustainability of vigorous plant growth to the Contract Administrator before commencing.

- a) Mix all samples together thoroughly before submitting for testing.
- b) Submit 0.5 kg sample of topsoil to testing laboratory and indicate present use, intended use, type of subsoil and quality of drainage. Prepare and ship sample in accordance with provincial regulations and testing laboratory requirements.
- c) In case the test results do not comply with the quality requirements, the Contractor shall amend as per the recommendations for corrections or remove and replace the topsoil at their own cost.
- d) When the source of such imported topsoil is exhausted, topsoil from a new source shall not be used until approved by the Contract Administrator/City of Brampton representative

Clause **OPSS 802.07.03** of OPSS 802 is amended by deleting the first and second paragraphs and replacing them with the following:

Topsoil for sodded and seeded areas shall be placed to a uniform depth of 150 mm on areas specified in the Contract Documents and up to the subgrade elevation on the roadway front slope.

Topsoil shall not be moved, delivered or worked on while in a frozen, wet or muddy state or condition.

Clause **OPSS 802.09.01.02** of OPSS 802 is amended by deleting the sentence and replacing it with the following:

Measurement for payment shall be by square meters following the contour of the ground.

Clause **OPSS 802.10.01** of OPSS 802 is amended by deleting the third sentence and replacing it with the following:

Payment for topsoil shall be included in the tender item for sod and/or seeding.

OPSS 802 shall also include the following:

When Topsoil is being place on top of granular in the median area, Terrafix 270R (or equivalent) filter fabric shall be installed between the topsoil and the granular.

BSS 803 CONSTRUCTION SPECIFICATION FOR SODDING (Revision April 27, 2018)

Clause **OPSS 803.05.01** of OPSS 803 is amended by deleting the existing and replacing with the following;

Sod shall be No1 Grade Turfgrass Nursery Sod, Kentucky Blue and according to the specifications of the Nursery Sod Growers Association of Ontario.

At the time of sale, No1 Grade Turfgrass Nursery Sod should be in a healthy condition. Sod of this quality may contain 1 broadleaf weed per 40 square metres and up to 1% native* grasses. Sod should be of sufficient shoot density that no surface soil will be visible from a standing position when mowed to a height of 40 mm. The mowing height range should be 30 to 70 mm with the exception of creeping bentgrass sod where mowing height is determined by the end use.

The thickness of the soil portion of the sod should not exceed 15 mm. Individual sod pieces shall be in such condition so that each may be lifted, rolled, transported and placed without breaking or tearing and without loss of soil under normal handling conditions

Clause **OPSS 803.05.02** of OPSS 803 is amended by the addition of the following:

Where slopes steeper than 2:1 are to be sodded, the sod shall be staked along every third row.

Clause **OPSS 803.07.01** of OPSS 803 is amended by the addition of the following;

Subgrade areas (native material) to be sodded shall be scarified to a depth of 100mm prior to where topsoil is to be placed.

Clause **OPSS 803.07.03** of OPSS 803 is amended by deleting the existing and replacing it with the following:

Fertilizer shall be applied uniformly to the surface area ,defined by the Contract Documents, 1 year following installation between the periods of May 1 to June 30 or September 1 to October 31, at the rate specified on its packaging by the manufacturer.

Clause **OPSS 803.07.04** of OPSS 803 is amended by deleting the existing and replacing it with the following:

Sod shall be placed in locations and as specified in the Contract Documents. Voids shall not be left between the soil portion of the sod and the underlying ground surface. Sod shall be securely placed lengthwise across the face of slopes and parallel to the centreline of ditches. End joints of adjacent sod pieces shall be staggered. The edges of adjacent sod pieces shall be placed tightly against one another without overlapping. Where required, sod should be staked to the grade to avoid movement:

- .1 Sod shall be installed within 24 hours after delivery to the site, and within 36 hours after harvesting
- .2 Sod shall be flush with adjoining grass areas, paving and the top surface of curbs unless otherwise on the drawings.
- .3 The sodded area shall be rolled, tamped or planked providing sufficient pressure, to ensure a close contact between sod and topsoil. Heavy rolling to correct irregularities in grade shall not be permitted.
- .4 settling of any finish grade shall not be more than 30mm from specified elevations, and if settling is greater, the contractor shall bring the grade to the specified elevation.

Clause **OPSS 803.07.05** of OPSS 803 is amended by the addition of the following:

- .1 Water sodded areas in sufficient quantities and at required frequency to maintain topsoil immediately under sod continuously moist for depth of 75 to 100 mm.
- .2 Prior to Performance Acceptance by the City, the sodded areas shall meet the following criteria:
 - .1 Sodded areas are properly established and are self-sustaining.
 - .2 Sod is free of bare and dead spots and without weeds.

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- .3 The height of the sod shall be maintained in the range of 75mm to 100mm
 - .4 No surface soil is visible when grass has been cut to height of 75 mm to 100mm
 - .5 Sodded areas have been cut a minimum two (2) times.
- .3 Contractor is responsible to arrange review of sod for Performance Acceptance within one (1) week of second cut. And is responsible for maintenance until accepted.
- .4 Areas sodded after November 1st will be reviewed for Performance Acceptance in the following Spring or at the discretion of the Contract Administrator and a representative from the City.
- .1 Sodded areas will be top dressed and aerated following the first winter the sod has been laid. If not accepted by the contract administrator and a representative from the City in the Fall of the previous year.

BSS 1010 MATERIAL SPECIFICATION FOR AGGREGATES – BASE, SUBBASE, SELECT SUBGRADE, AND BACKFILL MATERIALS (Revision July 2, 2013)

Clause **OPSS.MUNI 1010.05.02** of OPSS.MUNI 1010 is amended by deleting it and replacing it with the following:

The gradation requirements for Granular A will follow the City Standard 211. No Blast Furnace Slag material shall be allowed in granular base and sub base.

Based on visual inspection, if any contamination is observed including clay balls, clay coated particles, etc, **faulty material shall be replaced at the Contractor's sole cost.**

Clause **OPSS.MUNI 1010.05.03.03** of OPSS.MUNI 1010 is amended by deleting it and replacing it with the following:

The gradation requirements for Granular B Type II will follow the City Standard 211. No Blast Furnace Slag material shall be allowed in granular base and sub base.

Based on visual inspection, if any contamination is observed including clay balls, clay coated particles, etc, **faulty material shall be replaced at the Contractor's sole cost.**

OPSS 1010.MUNI Table 2 Gradation Requirements – Percent Passing shall be revised with the following:

All gradation requirements for Granular A, B, B Type II, 20 mm and 50 mm crusher run limestone shall be revised with the following City Standards 211 and 212. The contractor shall provide report from a Geotechnical Firm certifying a substitute to the

Rural Collector, Rural Local, Urban/Suburban Collector	64-28`	64-28	64-28	64-28	64-28	64-28	64-28	64-28
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The Contractor may submit a mix design to the Commisioner for approval using recycled asphalt-roofing shingles in base course mixes (approx. 3% by mass)

Clause **OPSS 1150.05.02.01** of OPSS 1150 shall also be amended by the addition of the following:

The use of a maximum 20% by mass of reclaimed asphalt pavement HL 8 only. HL8 incorporating RAP shall also conform to the requirements of OPSS 1154.

BSS 1350 MATERIAL SPECIFICATION FOR CONCRETE MATERIALS AND PRODUCTION (Revision July 2, 2013)

OPSS.MUNI 1350 shall also be amended by the addition of the following:

CONCRETE CURBS, MEDIANS, BOULEVARDS, IMPRESSED COLOURED CONCRETE, TRANSIT PADS, DRIVEWAYS AND SIDEWALKS

1 Materials

- Concrete thickness shall be minimum of 150 mm (unless otherwise specified) and constructed as per requirements of OPSS 351. Payment will be per square metre placed
- 19 mm nominal size aggregate
- Maximum water/cementing materials ratio of 0.45
- 32 MPa compressive strength at 28 days
- Plastic air content shall be 5% - 8% (CSA A23.1 Table 2 & Table 4)
- The maximum supplementary cementing material replacement value is limited to 25% slag or 15% fly ash or a combination of both materials not exceeding 25% total SCM replacement or 15% fly ash replacement (formula: $FA/15+SL/25 \leq 1.0$)

- Concrete slump shall be selected by the contractor based on the method of placement. Slump acceptance and/or rejection shall be based upon the slump tolerances identified in CSA A23.1 using the Contractor's target slump value.

IMPRESSED COLOURED CONCRETE

1 Materials

- .1 Integral coloured concrete to be "**Brampton Heritage**" pigment, by QC Construction Products, or approved equivalent, 5% integral loading per cubic metre. The integrally coloured concrete shall be antiqued with QC Powder Release using Cocoa Brown colour prior to imprinting with textured mats. Note: Imprinting tools in proper pattern will be as designated by the City of Brampton.
- .2 Type GU Portland cement
- .3 All imprinted concrete surfaces shall be treated with a deep penetrating QC-18 Acrylic Concrete Sealer, or equivalent as approved, "MATTE FINISH" sealer. Sealer shall be applied as per the manufacturer's specifications and maintained as per the manufacturer's requirements for the duration of the warranty period.
- .4 Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 MPa compressive strength at 28 days.
- .5 Concrete sealer: QC-18 Acrylic Concrete Sealer, distributed by Form & Build Supply (1-800-563-2285) or approved equivalent.
- .6 Powder Release: QC Powder Release (Cocoa Brown colour), or approved equivalent.

2 Quality Assurance

- .1 All work shall be performed as per plans and specifications and shall include but not be limited to the supply of all materials such as granular, concrete, colour hardeners, imprinting tools and sealers.
- .2 Samples shall be provided for approval by the City Representative along with references of past installations, which are comparable, in terms of size and complexity. A colour sample (minimum 200mm x 200mm) shall be provided for all requests for approved equivalents. For construction, an on-site mockup shall be provided, at a minimum of 2.0 metres square and shall be poured, finished, washed and sealed for City approval prior to commencement. Samples shall remain in place until project completion and acceptance of all Impressed Cast-in-place Concrete.

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- .3 The concrete contractor must satisfy the City authorities requirements in respect to job site supervisor, equipment and qualified labour force that has worked with the above mentioned materials and able to meet necessary deadlines. The contractor must have a minimum of 5 years experience applying and finishing colour hardeners on exterior concrete finishes.
 - .4 All materials used shall be outlined on a formal Tech-Data sheet for future information.

3 Patterns

- .1 Repairs to older, existing coloured concrete to match existing.
- .2 New, proposed coloured concrete:
 - .1 **Inside** of Road Right of Way (road allowance): pattern to be 200 x 200 mm stacked bond for kill strips and traffic median, and swirl finish for pedestrian traffic islands.
 - .2 **Outside** of Road Right of Way (road allowance): as per contract documents. [pattern to be specified and approved on a project-specific basis.]
 - .3 **Special Projects**: as per contract documents. [pattern to be specified and approved on a project-specific basis.]

4 Sealing

- .1 All imprinted concrete surfaces shall be treated with a deep penetrating approved sealer - MATTE FINISH.
- .2 All coloured concrete shall be sealed with QC-18 Acrylic Concrete Sealer after the excess powder release has been washed off and the surface allowed to dry. Sealer shall not be applied prior to a minimum of 10 days curing. Concrete must be completely dry prior to sealing. Product distributed by Form & Build Supply (1-800-563-2285) or approved equivalent.
- .3 All concrete to be sealed must be pressure washed and buffed to insure a clean surface to allow proper penetration of sealer. A City representative shall be present at the commencement of washing to confirm the finished colour against the approved sample.