

NOTE: These specifications apply to the installation and use of Bolduc-made Avenue series of concrete pavers. You should fill it out so that it is adapted to the site and the project's specific conditions. Some notes are drafted for a granular foundation. You can use other types of foundation.

NOTE: You must prepare computational guidelines and prescriptions for port and industrial applications from the ICPI's "Port and Industrial Pavement Design with Concrete Pavers" and "Airfield Pavement Design with Concrete Pavers" manuals.

Part 1 General

1.1 SECTION CONTENTS

- .1 Requirements for manually or mechanically installing precast concrete paver pavements and related methods of execution.

1.2 RELATED SECTIONS

- .1 Section [01 33 00 - Documents and samples to submit]
- .2 Section [01 45 00 - Quality Control]
- .3 Section [_____ - Preparation of Foundations]
- .4 Section [_____ - Curbs]
- .5 Section [_____ - Geotextile Filters]

1.3 REFERENCES

- .1 Canadian Standards Association (CSA).
 - .1 CSA-A231.2 Precast Concrete Pavers
 - .2 CSA A179 Mortar and grout for unit masonry
 - .3 CSA A283 Qualification code for concrete testing laboratories
 - .4 CSA A231 Concrete materials and methods of concrete construction
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C979 Standard Specification for Pigments for Integrally Colored Concrete.

1.4 SHOP DRAWINGS

NOTE: Demand drawings only if required by the characteristics, models or conditions.

- .1 Submit requisite shop drawings in accordance with Section [01 33 00 - Documents and Samples to Submit].
- .2 The shop drawings must show or indicate the layout, model and relationship among the paver joints and fixed elements, as well as the details specific to the work.

1.5 DOCUMENTS/SAMPLES TO SUBMIT

- .1 Data sheets
 - .1 Submit the following precast concrete paver data sheets:
 - .1 CSA A231.2 compliance test results
 - .2 Manufacturer's technical data and installation instructions
 - .2 Submit the following technical data regarding sampling, granulometry, mineralogical nature, origin and test results for the following materials:
 - .1 Bedding sand
 - .2 Joint-filling sand
- .2 Samples
 - .1 Submit samples required according to Section [01 33 00 - Documents and Samples to Submit].
 - .2 Submit a complete paver as a sample for each selected shape and color.

1.6 WORK MODEL

NOTE: Use the paragraph below based on the scope of work to be done.

- .1 Build the work model in accordance with Section [01 45 00 – Quality Control].
- .2 Set up a [3] m X [3] m work model. This will serve to determine overload of the bedding layer, and the pavers' lines, layouts, colors and textures.
- .3 Once [the Consultant] accepts the model, it will serve as the standard for assessing work conformity and may be incorporated into the project.
- .4 Protect the model for its eventual integration into the finished project.

1.7 MEASUREMENT FOR PAYMENT PURPOSES

NOTE: Use the paragraph below in accordance with the project.

- .1 Lump sum contract: all work will be paid according to the total amount described in the tender form.
- .2 Unit price contract: all work will be paid according to the unit amount described in the tender form.

Part 2 Products

2.1 CONCRETE PAVERS

- .1 Concrete pavers compliant with CSA-A231.2 standard and the following specifications:
 - .1 Paver model: Avenue, supplied by BOLDUC – or equivalent.
 - .2 Thickness: [_____].
 - .3 Dimensions: [_____] mm X [_____] mm.
 - .4 Color: [_____].
 - .5 Texture: [_____].
- .2 Pigments used to color concrete pavers: according to ASTM C979 standard.

2.2 BEDDING LAYER AND JOINT MATERIALS

NOTE: For the bedding layer and joints, select sand according to the purpose of paver surface use, ease of supply, and the quality of the materials in the region.

- .1 Sand for bedding layer and joints: clean, non-plastic, natural or obtained from stone or gravel crushing, and free of foreign materials and harmful substances. Do not use stone dust or limestone siftings.
- .2 Grain size: according to the table below – “Grading limits for fine aggregates” under standards CAN/CSA-A231 and CSA A179:

Sieve designation	% passing for bedding	% passing for joints
10 mm	[100]	
5 mm	[95 - 100]	100
2.5 mm	[80 - 100]	90 to 100
1.25 mm	[50 - 90]	85 to 100
0.630 mm	[25 - 65]	65 to 95
0.315 mm	[10 - 35]	15 to 80
0.160 mm	[2 - 10]	0 to 35
0.075 mm	[0 - 1]	0 to 1

NOTE: You can use bedding sand as joint sand in accordance with the above grain size table, but make sure you use sand whose largest grains easily fit into the smallest joints. If you use joint sand other than bedding sand, it is recommended to use the above grain size table. For paving surfaces that will bear vehicular traffic, use harder sands and preferably of 100% granite origin found in the region.

2.3 CURBS

.1 Rigid edges

- .1 Prefabricated Bolduc concrete curbs: according to the specifications of Section [____].
- .2 Concrete curbs: according to the specifications of Section [____].
- .3 Cut stone curbs: according to the specifications of Section [____].

.2 Flexible industrial curbs [PVC or average-density polyethylene] designed for paver installation, made with connectors and pre-drilled holes for anchoring nails.

- .1 Anchoring devices: [according to curb manufacturer's instructions] [galvanized steel twist anchors, [9.5 mm] diameter, [254 mm] long, installed [1] every [300] mm of curb and [100] mm on each side of the joints].

.3 [Aluminium] curbs [alloy [6061] [T-5 hardness] according to the Aluminium Association], designed for paver installation; to be driven into and between splices.

- .1 Anchoring devices: [according to curb manufacturer's instructions] aluminum anchor stakes designed for the curbs used, 30.5 mm long, installed [1] per [300] mm of curb and on each side of the joints].

.4 Curbs, [painted or galvanized steel] [____].

- .1 Anchoring devices: [according to curb manufacturer's instructions]

2.4 CLEANING PRODUCT

NOTE: Base selection on the cleaning product manufacturer and Bolduc's technical service's recommendations.

- .1 Clear organic solvent, designed and recommended by the manufacturer to remove dirt from concrete pavers
- .2 Acid-based chemical detergent, designed and recommended by the manufacturer to remove dirt from concrete pavers

2.5 SEALING COAT

NOTE: You may require sealing coats to improve appearance and facilitate the runoff of precipitation and contaminants, or to prevent the removal of joint material when subjected to extreme conditions. Base selection on the sealant manufacturer and Bolduc's technical service's recommendations.

- .1 Sealing coat [clear] [silanes] [siloxanes] [acrylic] [urethane], [solvent-based] [water-based] specially designed for application on pre-cast concrete pavers.

Part 3 Execution

3.1 PRIOR INSPECTION

NOTE: Make sure preparations for the granular base have been prescribed to ensure a proper surface for paver installation.

Perform foundation work according to the specifications of Section 12 of the "Cahier des charges et devis généraux". The recommended compaction level for vehicular use is 98% of the Modified Proctor Density. You should spread and compact the foundation of granular materials in uniform layers not more than 150 mm thick. A professional should inspect the geotextile material and placement (if applicable), preparation of the foundation, its surface tolerances, and paver elevations. The professional should also perform a compaction density test in accordance with the job requirements.

1. Ensure that the foundation complies with elevation and compaction requirements for paver installation. In the event of non-compliance, inform [the professional] and do not begin work before receiving new instructions from [the professional].
2. Ensure that the foundation surface does not deviate more than [10] mm over a [3] m distance in all directions.
3. Unless otherwise indicated, extend the foundation by at least one and a half times its own thickness beyond the limit of the surface to be covered.
4. Make sure the foundation isn't frozen and that stagnant water has not accumulated at the moment of paver installation.
5. Have [the professional] approve the foundation's installation before installing the bedding layer.
6. Verify the installation pattern and ensure all layout items are aligned according to the [drawings] [plans].
7. Inform the client's Representative in writing of any defect in foundational work performed [by others] that may affect paver installation.

3.2 CURB INSTALLATION

1. Install curbs at the indicated levels in compliance with manufacturer recommendations.

3.3 INSTALLING THE BEDDING LAYER

1. Ensure that the materials for installing the bedding layer are not, under any circumstances, saturated with water or frozen during the installation.
2. You must spread uncompacted bedding material evenly to a thickness averaging 15 mm and never exceeding 25 mm.
3. Bedding materials must remain loose until the pavers are laid. You must scarify, loosen and restore sectors consolidated in any way, even if only by rain, to their original condition.
4. Do not use bedding materials to fill depressions in the foundation.

3.4 INSTALLING THE CONCRETE PAVERS

- .1 Ensure that the pavers are clear of foreign material before installing them.
- .2 Install the pavers according to the patterns and models shown in the [drawings]. Keep paver joints aligned.
- .3 Installing concrete paver modules (of nominal dimensions [100x300] [100x450] [100x600] [150x150] [150x300] [150x450] [200x200] [200x400] [200x600] [300x300] [300x450] [300x600] [600x600] [500x500] Avenue M150 SL and Avenue 200 SL) should correspond exactly to the modules of typical frames (as illustrated in the drawings), at all points, on all assembled modules.
- .4 Place the paving elements at the prescribed level and locations, according to the indicated definitive layouts and patterns. You must separate pavers from each other by joints of at least 3 mm and at most 5 mm wide. Leave spaces prescribed in the drawings for all adjoining vertical elements.
- .5 Place the paver modules so you obtain the center-to-center distances indicated in the drawings. In general, the pavers have integrated spacers that ensure the minimum joint width, but do not serve for the paver's final positioning. Follow the dimensions, colors, frames and installation patterns indicated in the drawings.
- .6 The straightness of the horizontal joints must not deviate by more than 15 mm per 15 meters' length.
- .7 Saw-cut pavers that must be placed around obstacles and against fixed objects.
- .8 Do not cut concrete pavers exposed to automobile traffic by more than one-third their full size.
- .9 Avoid circulating any machinery, vehicles and equipment over concrete paver surfaces until pavers are vibrated and joints are filled. Place palettes of pavers and other materials so that the paved surface's load-bearing capacity is never exceeded or affected in any way.
- .10 Inspect installed pavers and replace any that are spalled, broken or damaged in any way, according to the [professional's] instructions.
- .11 Use low-amplitude, high-speed vibrating plates, with a compacting force of at least 22 kN at 75 to 100 Hz, to partially embed the pavers into the bedding layer.
- .12 Inspect installed pavers and remove any that are spalled, broken or damaged.
- .13 Use a broom to fill the joints with dry sand.
- .14 Compact the sand by tamping the pavers with vibrating plates.
- .15 Continue filling with sand and using the vibrating plates until the joints are completely full. Do not use the vibrating plates less than 1 m from unconstrained surface extremities.
- .16 At the end of each work shift, complete the installation up to 1 m from the extremity of the surface to be paved by thoroughly filling the joints with sand.
- .17 Once the pavers are installed, sweep away excess joint sand.
- .18 Continue filling the joints during the following days, under site traffic, to ensure complementary settlement and additional tightening of the sand in the joints.
- .19 The final level of the paved surface must not exhibit any deviation greater or less than [5] mm, as measured with the [3] m ruler.
- .20 The paved surface must be between [3] mm and [4] mm higher than adjacent manholes, drainage channels and concrete sleeves.
- .21 Ensure that the final pavement level complies with the specifications.

3.5 CLEANING

NOTE: You must clean the paved surface before applying a sealing coat.

- .1 Perform the cleaning under the conditions and at the moment recommended by the cleaning product manufacturer [immediately before applying the sealing coat] and in accordance with [the professional's] instructions.
- .2 Remove any loose foreign material from the paved surface.
- .3 Apply the appropriate cleaning products to rid the pavers of any dirt, in accordance with the manufacturer's recommendations.
- .4 Ensure that the finished surface is completely dirt-free.

3.6 APPLYING THE SEALING COAT

- .1 Ensure that the paver surface is dry, clean, properly prepared and free of any efflorescence and foreign material.
- .2 Apply the sealing coat according to the manufacturer's recommendations.
- .3 Do not allow any traffic over the coated surfaces until the sealing coat is dry and hardened.

3.7 SITE CLEANUP

- .1 Once the installation is completed, clear excess materials, waste, tools and safety barriers from the site.

END OF SECTION