

## 1 GENERAL

- 1.1 The work of this section includes the provision of all design, labour, materials, equipment and services required to fabricate and install parking lots as required for a complete project. The work includes, but is not necessarily limited to, the items referenced herein:
- 1.1.1 Parking Lot Base Courses
  - 1.1.2 Flexible Parking Lot Pavement
  - 1.1.3 Parking Lot Curb and Gutter
  - 1.1.4 Parking Lot Appurtenances
- 1.2 Definitions:
- 1.2.1 Heavy Vehicles: Private vehicles up to 23 000 kg.
  - 1.2.2 Light Vehicles: Private vehicles up to 3 000 kg.
- 1.3 References:
- 1.3.1 Sub-surface investigation report is provided to *[Design Builder]* for their use. The report is provided as a guide only. It is left to the *[Design Builder]* to formulate his own conclusions as to the extent of existing conditions and the accuracy of the report for proper design and construction of the roadways. Determine adequacy of sub-surface investigation report, and make additional engineering investigations at no extra cost if deemed necessary.
- 1.4 Reference Standards:
- 1.4.1 OPSS – Ontario Provincial Standard Specifications
  - 1.4.2 *[OPSS 1010 – Aggregates, March 1993]* – Granular A, B, M and select subgrade material.
  - 1.4.3 *[OPSS 1101 – Asphalt Cement, October 1989]* – Asphalt surfaces.
- 1.5 Quality Control:
- 1.5.1 Parking Lot Base Courses: Submit reports from independent testing firm certifying material gradation and compaction results obtained on site. Reports to bear the signature and stamp of a Professional Engineer licensed in the Province of Ontario.
  - 1.5.2 Flexible Road Pavement: Submit reports from independent testing firm certifying material gradation, asphalt cement extraction, and compaction results obtained on site. Reports to bear the signature and stamp of a Professional Engineer licensed in the Province of Ontario.

- 1.5.3 Precast parking curbs: Precast manufacturer to be certified under [CSA A251] to manufacture parking curbs.

## 2 DESIGN

- 2.1 Design Builder shall engage a qualified Professional Engineer licensed to practice in the Province of Ontario to design the pavement systems for the parking lot and loading areas. Each drawing and specification submission to bear the signature and stamp of a Professional Engineer licensed in the Province of Ontario
- 2.2 Design and construction to comply with recommendations of Geotechnical Engineer for heavy and light duty vehicle structures.
- 2.3 Design asphalt mix in accordance with [Asphalt Institute (AI) MS-2-1993], or latest edition, Mix Design Methods for Asphalt Concrete.
- 2.4 Design drive aisle alignment and cross section in accordance with the Manual of Geometric Design Standards for Canadian Roads including the Urban Supplement.
- 2.5 Design asphalt mix to OPSS standard for commercial sources.
- 2.6 Specify granular base and sub-base to OPSS standard for commercial sources.
- 2.7 Design parking lot signage to Manual for Uniform Traffic Control Devices for Canada.
- 2.8 Coordinate design of parking lot entrances to public road system with local road authority. Coordinate design of parking lot with site services requirements.
- 2.9 Coordinate grading and drainage design with the Stormwater Management Plan prepared for the project site. Comply with criteria established in the Master Servicing Report. Coordinate design of roadway with site services requirements. Design drainage so that drive aisles and access aisles are high points.
- 2.10 Provide designated area for deposition of cleared snow.
- 2.11 Minimum parking dimensions to be as per municipal standards and:
- 2.11.1 Parking stalls: [6100mm deep x 2750mm wide].
  - 2.11.2 Aisles: [6100mm wide].
  - 2.11.3 Interior Roads: [7500mm wide].

## 3 MATERIALS

- 3.1 Parking Lot Base Courses:
- 3.1.1 Crushed pit run or screened stone, gravel or sand consisting of hard durable angular particles free of clay lumps, cementation, organic material, and other deleterious materials.

- 3.1.2 Gradations to be within specified limits when tested to *[ASTM C136]* and *[ASTM C117]*. Sieve sizes to *[CAN/CGSB-8.1]*.
- 3.1.3 Liquid Limit: to *[ASTM D4318]*, Maximum 25.
- 3.1.4 Los Angeles Abrasion: to *[ASTM C131]*, Gradation 'A', Maximum % Loss by Mass: 40.
- 3.1.5 Particles smaller than 0.02 mm: to *[ASTM D422]*, Maximum 3%.
- 3.1.6 Soaked CBR: to *[ASTM D1883]*, Minimum 40.
- 3.2 Flexible Pavement:
  - 3.2.1 Asphalt Materials:
    - 3.2.1.1 Asphalt Cement: to *[CAN/CGSB-16.3]*.
    - 3.2.1.2 Reclaimed Asphalt Pavement: Crushed and screened to 100% passing, 50 mm screen before mixing.
    - 3.2.1.3 Asphalt Concrete Aggregates:
      - 3.2.1.3.1 Crushed or screened stone, gravel and sand.
      - 3.2.1.3.2 Gradations to be within limits specified when tested to *[ASTM C136]* and *[ASTM C117]*. Sieve sizes to *[CAN/CGSB-8.1]*.
      - 3.2.1.3.3 Sand equivalent: to *[ASTM D2419]*. Minimum 50.
      - 3.2.1.3.4 Magnesium Sulphate Soundness: to *[ASTM C88]*. Maximum % loss by weight: coarse aggregate 12, fine aggregate 16.
      - 3.2.1.3.5 Los Angeles Degradation: to *[ASTM C131]*. Maximum % loss by weight: coarse aggregate 35.
      - 3.2.1.3.6 Absorption: to *[ASTM C127]*. Maximum % by weight: coarse aggregate 1.75.
      - 3.2.1.3.7 Lightweight particles: to *[ASTM C123]*. Maximum % by mass, with less than 1.95 relative density: 1.5.
      - 3.2.1.3.8 Flat and elongated particles: to *[ASTM D4791]*. Maximum % by weight: coarse aggregate. 15.
      - 3.2.1.3.9 Mineral filler: finely ground particles of limestone, Portland cement or other non-plastic mineral matter.
      - 3.2.1.3.10 Tack Coat: to *[CAN/CGSB-16.2, grade SS-1]*.
  - 3.2.2 Curbs and Gutters:
    - 3.2.2.1 Concrete to *[CAN/CSA-A23.1]*.
    - 3.2.2.2 Concrete reinforcing steel to *[CSA G30.14]* and *[CAN/CSA G30.18]*.

- 3.2.2.3 Welded steel wire fabric for concrete reinforcement to *[CSA G30.5]*.
- 3.2.3 Parking Lot Appurtenances:
  - 3.2.3.1 Traffic Paint Materials
    - 3.2.3.1.1 Only products specified in the CPCA manual or specifically approved by the CPCA shall be used. Use only paints of the highest quality and low VOC selected from the CPCA Painting and Finishing schedule. Paint material shall be products of a single manufacturer.
    - 3.2.3.1.2 Colour:
      - 3.2.3.1.2.1. White: *[CGSB 1-GP-12C]*, white 513-301
      - 3.2.3.1.2.2. Yellow: U.S. Federal Standard 595B, yellow 33538
      - 3.2.3.1.2.3. Black: *[CGSB 1-GP-12C]*, black 512-301.

## 4 INSTALLATION

- 4.1 Parking Lot Base Courses:
  - 4.1.1 Place and shape granular material to lines and grades required by design.
  - 4.1.2 Compact granular material to 98% corrected maximum dry density in accordance with *[ASTM D698]*.
- 4.2 Flexible Parking Lot Pavement:
  - 4.2.1 Place asphalt pavement with mechanical self-powered pavers, capable of spreading hot mixes to lines and grades required.
  - 4.2.2 Compact hot mix with sufficient numbers of rollers of type and weight required to obtain density of 95% of density obtained in accordance with Marshall specimens prepared in accordance with *[ASTM D1559]*.
- 4.3 Curbs and Gutters: Install reinforcing and place concrete in accordance with *[CAN/CSA-A23.1]*.
- 4.4 Parking Lot Appurtenances:
  - 4.4.1 Painted Pavement Markings:
    - 4.4.1.1 Prepare surfaces and execute work in accordance with CPCA manual.
    - 4.4.1.2 Apply solvent based or water based traffic paint with uniform stripe of required width and thickness, with sharp edges without excessive splatter or over spray.
  - 4.4.2 Parking Curbs:

- 4.4.2.1 Locate curb a minimum of 900 mm for light vehicles.
- 4.4.2.2 For light vehicles, secure curbs by driving steel dowels into pavement with top of dowel flush with top of curb.

***End of Section***