

PART 1 GENERAL

1.1 SECTION INCLUDES	.1	Materials and installation for asphalt concrete pavement for car park areas, driveways to buildings, bikeways and walks or play areas.
1.2 MEASUREMENT PROCEDURES	.1	Asphalt concrete pavement including granular base and sub-base will not be measured separately.
1.3 REFERENCES	.1	American Society for Testing and Materials International, (ASTM)
	.1	ASTM C88-99a, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
	.2	ASTM C117-95, Standard Test Method for Material Finer Than 0.075 (No. 200) mm Sieve in Mineral Aggregates by Washing.
	.3	ASTM C123-98, Standard Test Method for Lightweight Particles in Aggregate.
	.4	ASTM C127-01, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
	.5	ASTM C128-01, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
	.6	ASTM C131-01, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
	.7	ASTM C136-01, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
	.8	ASTM D698-00a, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft <sup>3</sup> ) (600 kN-m/m <sup>3</sup> ).
	.9	ASTM D995-95b(2002), Standard Specification for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
	.10	ASTM D1557-00, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000

- ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
- .11 ASTM D1559-89, Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus, was withdrawn in 1998 with no replacement.
- .12 ASTM D2419-02, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .13 ASTM D3203-94(2000), Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- .14 ASTM D4318-00, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .15 ASTM D4791-99, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2 Asphalt Institute (AI)
  - .1 AI MS-2-1993 Sixth Edition, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.
  - .2 CAN/CGSB-16.1-M89, Cutback Asphalts for Road Purposes.
  - .3 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
  - .4 CAN/CGSB-16.3-M90, Asphalt Cements for Road Purposes.

#### 1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit asphalt concrete mix design to Departmental Representative for review.
- .3 Materials to be tested by testing laboratory approved by Departmental Representative.
- .4 Submit test certificates showing suitability of materials at least 4 weeks prior to commencing work.
- .5 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.6 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing work.

.7 Submit samples of following materials proposed for use at least 4 weeks prior to commencing work:

.1 One 5 L container of asphalt cement.

#### 1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal .

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused asphalt materials from landfill to local facility as approved by Departmental Representative.

.5 Divert unused aggregate materials from landfill to facility for reuse as approved by Departmental Representative.

.6 Unused protective coating material must be disposed of at an official hazardous material collections site as approved by Departmental Representative.

.7 Unused protective coating material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.8 Fold up metal banding, flatten and place in designated area for recycling.

## PART 2 PRODUCTS

### 2.1 MATERIALS

.1 Granular base and sub-base material following requirements:

- .1 Crushed or screened stone, gravel or sand.
- .2 Gradations: within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

#### .3 Table

Sieve Designation	Granular Base		Granular Sub-Base	
200 mm	-	-	-	-
75 mm	-	-	100	100
50 mm	100	-	-	-
38.1 mm	70-100	-	-	-
25 mm	-	-	55-100	-
19 mm	50-75	100	-	-
12.5 mm	-	70-100	-	-
9.5 mm	40-65	-	-	-
4.75 mm	30-50	40-70	25-100	-
2.00 mm	-	23-50	15-80	-
0.425 mm	10-30	7-25	4-50	0-30
0.180 mm	-	-	-	-
0.075 mm	3-8	3-8	0-8	0-8

.4 Granular base aggregates:

- .1 Crushed particles: at least 60 % of particles by mass retained on 4.75 mm sieve to have at least 1 freshly fractured face.
- .2 Liquid limit: to ASTM D4318 , maximum 25.
- .3 Plasticity index: to ASTM D4318 , maximum 6.

.2 Asphalt concrete aggregates:

- .1 Coarse aggregate is aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C117 .
- .2 When dryer drum plant or plant without hot screening is used, process fine aggregate through 4.75 mm sieve and stockpile separately from coarse aggregate.
- .3 Separate stock piles for coarse and fine aggregate are not required for sheet asphalt.
- .4 Do not use aggregates having known polishing characteristics in mixes for surface courses.
- .5 Aggregate: material following

requirements:

- .1 Crushed stone or gravel.
- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

.3 Table

Sieve Designation	% Passing	Asphalt Concrete	Sheet Asphalt
200 mm	-		-
75 mm	-		-
50 mm	-		-
38.1 mm	-		-
25 mm	-		-
19.0 mm	100		-
12.5	-		100
9.5 mm	60-80		100
4.75 mm	40-65		85-100
2.00 mm	30-50		80-95
0.425 mm	15-30		40-70
0.180 mm	5-20		10-35
0.075 mm	3-8		4-14

- .4 Sand equivalent: to ASTM D2419, Minimum 50.
- .5 Magnesium Sulphate soundness: to ASTM C88. Max % loss by weight: coarse aggregate 12, fine aggregate 16.
- .6 Los Angeles Degradation: to ASTM C131. Max % loss by weight: coarse aggregate, 35.
- .7 Absorption: to ASTM C127. Max % by weight: coarse aggregate, 1.75.
- .8 Lightweight particles: to ASTM C123. Max % by mass, with less than 1.95. Relative density (formally Specific Gravity): 1.5.
- .9 Flat and elongated particles: to ASTM D4791, (with length to thickness ratio greater than 5): Max % by weight: coarse aggregate, 15.
- .10 Crushed particles: at least 60 % of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

.11 Table

Passing		Retained on
19 mm	to	9.5 mm
9.5 mm	to	4.75 mm

.12 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.

.3 Mineral filler for asphalt concrete:

.1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.

.2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed by Departmental Representative to improve mix properties.

.4 Asphalt cement: to CAN/CGSB-16.3.

.5 Asphalt prime: to CAN/CGSB-16.1, grade RM-20 MC-70 CAN/CGSB-16.2, grade SS-1.

.6 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.

.7 Protective coating: colour as selected from manufacturer's standard.

.8 Asphalt tack coat: to CAN/CGSB-16.2, grade SS-1.

## 2.2 EQUIPMENT

.1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of rollers of type and weight to obtain specified density of compacted mix.

.3 Vibratory rollers for parking lots and driveways:

.1 Minimum drum diameter: 750 mm.

.2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.

- .4 Haul trucks: of sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
  - .1 Boxes with tight metal bottoms.
  - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
  - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
- .5 Suitable hand tools.

### 2.3 MIX DESIGN

- .1 Mix design to AI MS-2.
- .2 Job mix formula to be approved by Departmental Representative.
- .3 Design of mix: by Marshall method to requirements below:
  - .1 Compaction blows on each face of test specimens: 50.
  - .2 Mix physical requirements:
 

Property	Sheet Asphalt	Concrete
Marshall Stability at 60 degrees C, kN minimum.	3.0	5.5
Flow Value, mm.	2-5	2-4
Air Voids in Mixture, %		3-5
Voids in Mineral Aggregate, % minimum		16
Index of Retained Stability, % minimum		75
  - .3 Measure physical requirements as follows:
    - .1 Marshall load and flow value: to ASTM D1559.
    - .2 Compute void properties on basis of bulk specific gravity of aggregate to ASTM C127 and ASTM C128. Make allowance for volume of asphalt absorbed into pores of aggregate.
    - .3 Air voids: to ASTM D3203.
    - .4 Voids in mineral aggregate: to AI MS-2, chapter 4.
    - .5 Index of Retained Stability: measure in accordance with Section 32 12 10 - Marshall Immersion Test for Bitumen.

- .4 Do not change job-mix without prior approval of Engineer Consultant. When change in material source proposed, new job-mix formula will be provided to be approved to be reviewed by Departmental Representative.
- .5 Return plant dust collected during processing to mix in quantities acceptable to Departmental Representative.

### PART 3 EXECUTION

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| <u>3.1 SUBGRADE<br/>SURFACE<br/>PREPARATION AND<br/>INSPECTION</u> | <ul style="list-style-type: none"> <li>.1 Verify grades of items set in paving area for conformity with elevations and sections before placing granular base and sub-base material.</li> <li>.2 Obtain approval of subgrade by Departmental Representative before placing granular sub-base and base.</li> </ul>   |
| <u>3.2 GRANULAR<br/>SUB-BASE AND<br/>GRANULAR BASE</u>             | <ul style="list-style-type: none"> <li>.1 Place granular base and sub-base material on clean unfrozen surface, free from snow and ice.</li> <li>.2 Place granular base and sub-base to compacted thicknesses of 100 and 150 mm respectively. Do not place frozen material.</li> <li>.3 Place in layers not exceeding 150 mm compacted thickness. Compact to density not less than 98 % corrected maximum dry density maximum dry density in accordance with ASTM D698 ASTM D1557.</li> <li>.4 Finished base surface to be within 10 mm of specified grade, but not uniformly high or low.</li> </ul> |
| <u>3.3 ASPHALT<br/>PRIME</u>                                       | <ul style="list-style-type: none"> <li>.1 Cutback asphalt:               <ul style="list-style-type: none"> <li>.1 Heat asphalt prime for pumping and spraying in accordance with CAN/CGSB-16.1.</li> <li>.2 Apply cutback asphalt prime to granular base, at rate directed by Engineer Consultant, but do not exceed 2.2 L/m2.</li> <li>.3 Apply on dry surface, unless otherwise</li> </ul> </li> </ul>  |



directed by Departmental Representative.

- .2 Emulsified asphalt:
  - .1 Dilute asphalt emulsion with clean water at 1:1 ratio for application. Mix thoroughly by pumping or other method approved by Departmental Representative.
  - .2 Apply diluted asphalt emulsion at rate directed by Departmental Representative but do not exceed 5 L/m2.
  - .3 Apply on damp surface unless otherwise directed by Departmental Representative.
- .3 Do not apply prime when air temperature is less than 5 degrees C or when rain is forecast within 2 hours.
- .4 If asphalt prime fails to set cure within 24 hours, spread sand blotter material in amounts required to absorb excess material. Sweep and remove excess blotter material.

#### 3.4 PLANT AND MIXING REQUIREMENTS

- .1 In accordance with ASTM D995.

#### 3.5 ASPHALT CONCRETE PAVING

- .1 Obtain approval of tack coat base and primer from Departmental Representative before placing asphalt mix.
- .2 Place asphalt mix only when base or previous course is dry and air temperature is above 5 degrees C.
- .3 Place asphalt concrete in compacted layers not exceeding 75 mm two lifts.
- .4 Minimum 135 degrees C mix temperature required when spreading.
- .5 Maximum 160 degrees C mix temperature permitted at any time.
- .6 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.
- .7 Compact parking lot and driveway asphalt concrete to density not less than 95 % of density obtained with Marshall specimens prepared in accordance with ASTM D1559 from samples of mix being used. Roll until roller

marks are eliminated.

- .8 Keep roller speed slow enough to avoid mix displacement and do not stop roller on fresh pavement.
- .9 Moisten roller wheels with water to prevent pick up of material.
- .10 Compact mix with hot tampers or other equipment approved by Departmental Representative, in areas inaccessible to roller.
- .11 Finish surface to be within 10 mm of design elevation and with no irregularities greater than 10 mm in 4.5 m.
- .12 Repair areas showing checking, rippling or segregation as directed by Departmental Representative.

### 3.6 JOINTS

- .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
- .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .3 For cold joints, cut back to full depth vertical face and tack face with hot asphalt.
- .4 For longitudinal joints, overlap previously laid strip with spreader by 25 to 50 mm.

### 3.7 PROTECTIVE COATING

- .1 Apply 2 coats of protective coating to completed paved areas and asphalt curbs in accordance with manufacturer's instructions.

### 3.8 TESTING

- .1 Inspection and testing of asphalt pavement will be carried out by designated testing laboratory in accordance with Section 01 45 00 - Testing and Quality Control.
- .2 Costs of tests will be paid by Departmental Representative.

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| <u>3.9</u> | <u>PROTECTION</u> |   |
|            | .1                | Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38 degrees C. Do not permit stationary loads on pavement until 24 hours after placement. |
|            | .2                | Provide access to buildings as required. Arrange paving schedule so as not to interfere with normal use of premises.  |

PART 1 GENERAL

1.1 SECTION INCLUDE	.1	Materials and installation for chain link fences and gates.
	.2	Reuse existing fence where possible.
	.3	Sustainable requirements for construction, verification and operation.
1.2 RELATED SECTIONS	.1	Section 01 33 00 - Submittal Procedures.
	.2	Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
	.3	Section 01 35 30 - Health and Safety Requirements.
	.4	Section 09 91 13 - Exterior Painting.
1.3 REFERENCES	.1	American Society for Testing and Materials International, (ASTM).
	.1	ASTM A53/A53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
	.2	ASTM A90/A90M-01, Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
	.3	ASTM A121-99, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
	.4	A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
	.5	ASTM C618-03, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
	.6	ASTM F1664-01, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
	.2	Canadian General Standards Board (CGSB).
	.1	CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
	.2	CAN/CGSB-138.2-96, Steel Framework for

- Chain Link Fence.
  - .3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
  - .4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
  - .5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
  - .3 Canadian Standards Association (CSA International).
    - .1 CAN/CSA-A23.1/A23.2-00 (August 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
    - .2 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
    - .3 CAN/CSA-A3000-98 (R2002), Cementitious Materials Compendium. Includes:
      - .1 CAN/CSA-A23.5-98, Supplementary Cementing Materials
  - .4 Department of Justice Canada (Jus).
    - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
  - .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
    - .1 Material Safety Data Sheets (MSDS).
  - .6 The Master Painters Institute (MPI) - Architectural Painting Specification Manual - March 1998.
    - .1 MPI # 18, Organic Zinc Rich Primer.
  - .7 Transport Canada (TC).
    - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- 1.4 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets.
  - .3 Shop Drawings to indicate:
    - .1 Fence fabric gauge and finish.
    - .2 Post and rail dimension and finish.
    - .3 Gate frame dimension and finish.
    - .4 Required fittings and hardware.

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| 1.5 HEALTH AND SAFETY             | .1  | Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.  |
| 1.6 WASTE MANAGEMENT AND DISPOSAL | .1  | Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.   |
|                                   | .2  | Remove from site and dispose of packaging materials at appropriate recycling facilities.  |
|                                   | .3  | Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan. |
|                                   | .4  | Separate for recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.   |
|                                   | .5  | Place materials defined as hazardous or toxic in designated containers.   |
|                                   | .6  | Handle and dispose of hazardous materials in accordance with CEPA, TDGA , Regional and Municipal regulations.   |
|                                   | .7  | Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative.  |
|                                   | .8  | Divert unused concrete materials from landfill to local quarry facility as approved by Departmental Representative.   |
|                                   | .9  | Unused paint or coating material must be disposed of at official hazardous material collections site as approved by Departmental Representative.  |
|                                   | .10 | Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.                     |
|                                   | .11 | Fold up metal banding, flatten and place in designated area for recycling.  |

PART 2 PRODUCTS

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| <u>2.1 MATERIALS</u> | .1 | Concrete mixes and materials: in accordance with CAN/CSA-A23.1.  |
|                      | .1 | Nominal coarse aggregate size: 20 - 5 mm.  |
|                      | .2 | Compressive strength: 20 MPa minimum at 28 days.   |
|                      | .2 | Chain-link fence fabric: to CAN/CGSB-138.1.  |
|                      | .1 | Type 1, Class A, heavy style, Grade 2.   |
|                      | .2 | Height of fabric: as indicated.  |
|                      | .3 | Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.  |
|                      | .4 | Top and bottom tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.  |
|                      | .5 | Tie wire fasteners: aluminum wire.   |
|                      | .6 | Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.   |
|                      | .7 | Gates: to CAN/CGSB-138.4.  |
|                      | .8 | Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.       |
|                      | .1 | Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized and painted with zinc pigmented paint after welding.                                    |
|                      | .2 | Fasten fence fabric to gate with twisted selvage at top.   |
|                      | .3 | Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate. |
|                      | .4 | Furnish double gates with chain hook to hold gates open and centre rest with drop bolt for closed position.  |
|                      | .9 | Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.  |
|                      | .1 | Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum   |

- aluminum.
- .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
- .3 Overhang tops to provide waterproof fit, to hold top rails.
- .4 Turnbuckles to be drop forged.
- .10 Organic zinc rich coating: to CAN/CGSB-1.181 MPI #18.

## 2.2 FINISHES

- .1 Galvanizing:
  - .1 For chain link fabric: to CAN/CGSB-138.1 Grade2.
  - .2 For pipe: 550 g/m2minimum to ASTM A90.
  - .3 For barbed wire: to ASTM A121, Class 2 CAN/CGSB-138.2.
  - .4 For other fittings: to CAN/CSA-G164.

## PART 3 EXECUTION

### 3.1 GRADING

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
  - .1 Provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.

### 3.2 ERECTION OF FENCE

- .1 Erect fence along lines as indicated and to CAN/CGSB-138.3.
- .2 Excavate post holes to dimensions indicated 900 mm depth x 300 mm diameter.
- .3 Space line posts 3 m apart, measured parallel to ground surface.
- .4 Space straining posts at equal intervals not to exceed 150 m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150 m.
- .5 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.
- .6 Install corner post where change in alignment exceeds 10 degrees.



- .7 Install end posts at end of fence and at buildings.
  - .1 Install gate posts on both sides of gate openings.
- .8 Place concrete in post holes then embed posts into concrete to minimum 700 mm depth.
  - .1 Extend concrete 50 mm above ground level and slope to drain away from posts.
  - .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .9 Do not install fence fabric until concrete has cured minimum of 5 days.
- .10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface at inclination as indicated.
  - .1 Install braces on both sides of corner and straining posts in similar manner.
- .11 Install overhang tops and caps.
- .12 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .13 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.
- .14 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.
  - .1 Knuckled selvedge at bottom.
  - .2 Twisted selvedge at top.
- .15 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.
  - .1 Give tie wires minimum two twists.

### 3.3 INSTALLATION OF GATES

- .1 Install gates in locations as indicated.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.

- .3 Determine position of centre gate rest for double gate.
  - .1 Cast gate rest in concrete as directed.
  - .2 Dome concrete above ground level to shed water.
- .4 Install gate stops where indicated.

#### 3.4 TOUCH UP

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas in accordance with Section 09 91 13 - Exterior Painting.
  - .1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

#### 3.5 CLEANING

- .1 Clean and trim areas disturbed by operations.
  - .1 Dispose of surplus material and replace damaged turf with sod as directed by Departmental Representative.