

## **Section B – Part 1 – Supplemental Standards for Roads (SR)**

## **102 General Specification for Material Weighing**

### **102.07 Construction**

#### **102.07.01 Weighing**

##### **102.07.01.01 Mass Measurement**

*Subsection 102.07.01.01 is deleted in its entirety and replaced by the following:*

Mass measurement of all granular and asphalt material shall be electronically transmitted from the platform weight sensing device to the computer, with a direct cable connection.

Any form of manual override, except total transaction rejection, will not be allowed.

Tickets of laser quality type shall be produced electronically, using black print only, on a printing device connected by direct cable connection to the computer, capable of producing **accurate** tickets conforming to the Owner's requirements. Tickets shall be supplied by the Contractor and shall indicate the truck number, type of material, gross weight, net weight, tare weight and contract number.

**Note: Handwritten Tickets Will Not Be Accepted.**

## **180 General Specification for the Management of Excess Material**

### **180.04 Design and Submission Requirements**

#### **180.04.01 Submission Requirements**

##### **180.04.01.01 Notification of Site Selection and Property Owner Release**

*Clause 180.04.01.01 is amended by the addition of the following paragraphs:*

The Contractor is advised that certain areas of the City of London and surrounding municipalities are regulated by the Conservation Authorities including the Upper Thames River Conservation Authority, Lower Thames Valley Conservation Authority and the Kettle Creek Conservation Authority. The placement of fill material in certain areas may not be acceptable or in accordance with Section 28 of the Conservation Authorities Act. The Contractor shall be required to provide evidence to the Contract Administrator of approvals and / or permits from the affected Conservation Authority, prior to the disposal of any fill material (including but not limited to topsoil, subsoil, concrete or dredged sediment, etc.). If the Conservation Authority advises the Contractor that the site is not within a fill regulated area or flood plain and therefore does not need an approval or a permit from the Conservation Authority, the Contractor shall provide written evidence of this to the Contract Administrator.

Should any disposal site selected by the Contractor require any approvals or permits for receiving excess material in any capacity, costs for such approvals or permits will be included in the unit rate quoted by the Contractor to excavate and remove the material from site.

**180.07 Construction**

**180.07.01 Conditions on Management of Excess Material – General**

*Clause 180.07.01 paragraph 3 is removed in its entirety and replaced with the following:*

When Asbestos Cement Material is encountered and requires removal to complete the work, the Contractor shall comply with Section 17 of Regulation 347 under the environmental Protection Act. Asbestos waste shall be collected and sealed in suitable containers for transportation and disposal at London's W12A Landfill site located on Manning Drive.

The Contractor is responsible for contacting W12A at (519) 661-CITY (2489) ext.8414 at least 24 hours in advance of such delivery, with a time and estimated quantity of asbestos material to be delivered. Arrangements will be made to have the applicable fees paid for directly by the City of London.

**201 Construction Specification for Clearing, Close Cut Clearing, Grubbing and Removal of Surface and Piled Boulders**

**201.07 Construction**

**201.07.01 General**

*Clause 201.07.01 is amended by the addition of the following:*

Where tree trimming, brush and tree removal is undertaken near overhead wires, the work shall be according to the following terms and conditions.

**Line Clearing around London Hydro's Electric System**

IHSA (Infrastructure Health and Safety Association)" states that only competent personnel shall be assigned to perform line clearing operations within 3 meters (10 feet) of energized conductors or apparatus operating in excess of 750V.

In order that London Hydro knows who is working around its electric system the following is required:

- Contractors shall provide London Hydro with the list of qualifications and documentation of training.
- When Contractors need a hold-off they must inform London Hydro of their work location and must provide London Hydro with a method of communication in the event the feeder trips or the hold-off needs to be revoked.

The Contractor is to contact London Hydro Forestry at (519) 661-5800 ext. 5941 for assistance at least 3 working days before the start of the project.

## Permits and Inspections

- a) It will be the responsibility of the Contractor to obtain and pay for any necessary permits and inspections required to complete the work.
- b) The Contractor is responsible for securing appropriate “hold offs” and notifying London Hydro at (519) 661-5800 ext. 5585. At all times, “hold offs” will be required when working in the proximity of high voltage lines.

## Incidental Costs

The City will assume no incidental costs including those for:

- a) insurance
- b) permits, fees and locates
- c) temporary road closures, barriers and lights
- d) disposal of wood, chips, stump shavings or other by products of the operation.

## Employee Qualifications

The project shall be completed by a firm of recognized standing having at least five (5) years’ experience in this type of work and having the necessary equipment and skilled labour to carry out the work satisfactorily.

Contractors must be a member in good standing with the Infrastructure Health and Safety Association (IHSA) and remain so throughout the term of the contract.

The foreperson and all operators will be certified by IHSA in the “Safety in Line Clearing Operations” Line Clearing Technician Proficiency” course or current equivalent and will possess valid certification.

All equipment, vehicles, tools and hydro gloves will be regularly dielectrically tested for safe use in proximity to high voltage lines and maintained as per IHSA Electrical Utility Safety Rule Book. Dielectric Test results will be provided for all equipment within 12 months.

All tree trimmers must provide proof of chainsaw training, appropriate Driver’s License and an ISA or Equivalent Arborist Certification, and IHSA Electrical Safety for Ground support Crew card. Failure to comply with these regulations may result in immediate suspension of work or termination of the contract.

The contractor would employ only trained and capable forestry workers using the following criteria:

- Emergency First Aid Certificate, minimum two (2) persons per work site
- WHMIS
- IHSA Electrical Safety for Ground support Crew. “Safety in Line Clearing Operations”
- Tree Rescue and Fall Arrest Training for Climbers
- Aerial Bucket Rescue Training for Aerial Device Operators
- Chainsaw Certificate of Training for each employee operating a chainsaw



- Fall Protection
  - Training in CSA Z462-12 Workplace Electrical Safety
- a) Supervising Working Foreperson: Will have at least five (5) years' experience in all aspects of urban forestry and in a supervisory capacity. This individual will have at least three (3) of experience in all phases of utility line clearing. The Supervisory Working Foreperson will be an ISA Certified Arborist or equivalent having a thorough knowledge of tree structure, growth habits, pruning requirements and structural weaknesses.
- b) Climber / Bucket Operator: These individuals will have at least three (3) years of experience in urban tree maintenance and will work under the direction of the Foreperson. They will be fully trained in the identification of tree species and have a full knowledge of their structure, growth habits and pruning requirements. They must be experienced in working in the proximity to all types of utility lines. The ability to operate personal lift devices, chainsaws and other related equipment. At all the times a crew member will have the ability to climb manually and work safely throughout the trees without the use of lift devices, using approved climbing gear.

**No free climbing will be permitted at any time.  
No climbing spurs will be permitted on City trees which will remain.**

- c) Chipper Operators, Labourers/Ground Crew: Must be familiar with all aspects of tree maintenance and related equipment.

### **Approval of Contractor's Equipment**

All equipment used on the contract shall meet with the approval of the Contract Administrator. All vehicles and equipment must be available for inspection prior to the start of any project. Cleated vehicles will not be permitted to operate on existing asphalt pavement.

If the Contractor does not have sufficient equipment on the job to carry out the work satisfactorily, the Contract Administrator may suspend the work. Any suspension of work by the Contract Administrator or lack of equipment to carry out the work shall not entitle the Contractor or the General Contractor to an extension of time to complete and shall remain liable for any liquidated damages caused by the failure to complete the contract within the time specified.

### **Utility Line Clearance (Where greater than 10 feet from London Hydro Electric System)**

Where limbs may contact utility lines or are close that movement in the trees could bring them in to contact with the lines, branches shall be cut off using only insulated pole pruners C.S.A. approved for such work. Where practical, this work will be done from the ground or from an aerial lift.

The notching of tree crown and other distortion of the natural form will be kept to a minimum.

All branches, limbs or twigs above utility lines that are to be removed will be cut in such a way as to fall safely beyond the conductors. If this is not possible, limbs will be roped for lowering around the utility lines.

Where service lines pass through or adjacent to a tree, all limbs that could under normal climatic weather conditions strain or break the utility lines shall be removed. A clearance of 0.5m (18") minimum is required to prevent current leakage to the ground and other service disruptions.

### Clean-up and Disposal

1. All wood chips from the chipping operation are to be disposed of off-site or can be used on site at the Contract Administrators discretion.
2. The Contractor is responsible for the disposal of all wood from trunks and limbs at sites arranged by the Contractor. The Contractor will be required to comply with tree removal restrictions resulting from the Emerald Ash Borer or other Forest health restrictions applicable to the site.
3. The Contractor shall be responsible for the removal of all brush, wood chips, debris and all work areas shall be left in a lean, tidy and safe condition at the close of each daily working period. It is expressly understood that no diseased timbers shall be salvaged and used for commercial purposes by the Contractor.

## 206 Construction Specification for Grading

### 206.07 Construction

#### 206.07.03 Excavation and Grading

##### 206.07.03.01 Earth Excavation - Grading

##### 206.07.03.01.03 Excavation Below Subgrade

*Clause 206.07.03.01.03 is deleted in its entirety and replaced by the following:*

Unsuitable materials, other than material excavated from swamps, shall be removed below the subgrade to the lengths, widths and depths specified either in the contract or as directed by the Contract Administrator during the time of construction. The resulting excavation shall be backfilled with acceptable material which shall be compacted.

### 206.09 Measurement for Payment

#### 206.09.01 Actual Measurement

##### 206.09.01.01 Earth Excavation (Grading)

*Clause 206.09.01.01 is amended by the addition of the following:*

"EARTH EXCAVATION BELOW SUBGRADE", may also be measured in tonnes of Provisional Granular 'C'.

**206.10 Basis of Payment**

**206.10.01 Earth Excavation, Grading - Item**

*Subsection 206.10.01 is amended by the addition of the following:*

When earth excavation below subgrade is paid by the tonne under the item in the Form of Tender "EARTH EXCAVATION BELOW SUBGRADE (INCLUDING PROVISIONAL GRANULAR 'C' BACKFILL)", the Contractor will comply with the requirements of O.P.S.S. Clause 206.07.03.01.03

It will include the disposal of unsuitable material, supply, backfill and compaction of Provisional Granular 'C' to fill the sub-excavation void under the Direction of the Contract Administrator.

**310 Construction Specification for Hot Mix Asphalt**

**310.07 Construction**

**310.07.03 Tack Coat**

*Clause 310.07.03.01 is amended by the addition of the following:*

The work required for this item shall be carried out on ALL milled surfaces and in situations where the placement of asphalt lifts is separated by more than two weeks (14 days).

**310.07.05 Sampling**

**310.07.05.01 Asphalt Cement**

**310.07.05.01.01 General**

*310.07.05.01.01 is extended by the addition of the following:*

...or as per arrangements with the Contract Administrator.

**310.07.05.01.02 Frequency and Location**

*310.07.05.01.02 is extended by the addition of the following:*

...or at the discretion of the Contract Administrator

**310.07.05.02 Hot Mix Asphalt**

**310.07.05.02.01 General**

*Delete subsection 310.07.05.02.01 in its entirety and replace with the following:*

The Owner shall make all arrangements for Quality Assurance sample testing.

**310.07.05.02.02 Frequency and Location**

*Delete subsection 310.07.05.02.02 in its entirety and replace with Table 6 of the City of London Supplemental Standards for Roads.*

**310.07.05.02.03 Labeling**

*Delete subsection 310.07.05.02.03 in its entirety.*

**310.07.05.02.04 Cores**

*Subsection 310.07.05.02.04 is deleted in its entirety and replaced by the following:*

**Core Samples**

The minimum thickness of the compacted hot mix layer(s) shall be as specified on the contract drawings and / or in the tender document. The surface of the hot asphalt mix shall conform to the grades shown on the contract drawings. The Owner may, at their option and expense, require the Contractor to obtain 100mm diameter cores of the compacted hot mix to verify the thickness of the layer(s). Holes made by the removal of such samples shall be filled with the specified hot mix and compacted in accordance with OPSS.MUNI 310.07.05.03.

If the average thickness of the base asphalt and/or surface asphalt varies by 15mm greater than or less than the specified hot mix thickness, the hot mix asphalt placed shall be removed and replaced at no cost to the owner.

Where the minimum thickness of asphalt (base or surface) is specified as 40mm and the average thickness varies by 10mm greater than or less than the hot mix thickness, the hot mix asphalt placed shall be removed and replaced at no cost to the owner.

**310.07.05.02.05 Delivery**

*Delete subsection 310.07.05.02.05 in its entirety.*

**310.07.08 Widenings and Irregular Sections**

*Subsection 310.07.08 (a) is deleted in its entirety and replaced with the following:*

**a) Widenings**

The Hot Mix Asphalt (HMA) shall be placed in widenings such that the top of the compacted HMA is flush with the top of the existing pavement. The new asphalt shall be keyed into the existing asphalt by stepped joint.

## **310.07.11 Longitudinal and Transverse Joints**

### **310.07.11.01 General**

*Subsection 310.07.11.01 paragraph 2 is deleted in its entirety and replaced by the following:*

Longitudinal and transverse butt or stepped joints between the new HMA pavement and the existing pavement shall be constructed by trimming or milling the existing pavement edge to a straight clean vertical surface of at least 50mm. When matching new asphalt to existing asphalt, ensure that all joints will be located in the lane transition tracks (i.e., same location as line markings) and any cut areas can be restored with conventional paving equipment and rollers.

All cuts shall be squared off to avoid any hand placed areas. The guidelines as shown in the City of London Drawing SR-14 shall be followed. Unless otherwise directed by the Construction Administrator, no asphalt ramping will be permitted for joints within arterial roads. Joints to match new asphalt to existing elevations within arterial roads.

Damage/disturbance to the edge of the mat by construction traffic, public traffic and the like prior to placing an adjacent HMA mat shall not be permitted.

Damaged/disturbed areas shall be repaired to the satisfaction of the Contract Administrator prior to paving the adjacent mat.

### **310.07.14 Surface Appearance**

*Subsection 310.07.14 is amended by the addition of the following:*

The repair to a rejectable surface course will be the greater of a minimum of 1 full lane width or total lane width of paving done in echelon by a minimum length that is to be determined by the Contract Administrator

### **310.07.16 Painting Edge of Concrete Curb and Gutter Reveal**

*Clause 310.07 is amended by the addition of the following subsection 310.07.16*

On all projects where the top asphalt is not expected to be placed immediately following the placement of base asphalt, and the concrete curb reveal is exposed for more than forty-eight (48) hours, the Contractor shall at their expense be responsible for supplying, placing and maintaining fluorescent orange spray paint on the exposed edge of the curb reveal.

At a minimum, the Contractor shall apply paint to the curb reveal within forty-eight (48) hours after the base asphalt has been placed, prior to snow accumulation and again in the spring immediately after the snow has melted or as directed by the Contract Administrator.

Where top asphalt placement is delayed beyond the next paving season, the Contractor is required to continue maintaining the painting of the curb reveal and will be reimbursed at time and materials.

### **310.07.17                      Asphalt Ramping**

*Clause 310.07 is amended by the addition of the following subsection 310.07.17*

The Contractor will be responsible for supplying, placing and compacting hot mix asphalt to provide asphalt ramps at wheelchair ramps, intersecting side streets in conjunction with the placement of base asphalt.

The asphalt ramps will cover the entire width and will extend 500mm from the curb or raised edge of pavement as directed by the Contract Administrator.

Unless otherwise directed by the Construction Administrator, no asphalt ramping will be permitted for longitudinal joints within arterial roads. All milled surface on arterial roads shall be squared off at the end of each day to avoid longitudinal asphalt ramps.

### **310.08                              Quality Assurance**

#### **310.08.01                      General**

*310.08.01 First paragraph is extended by the following:*

... or at the discretion of the contract administrator. Duplicate samples shall be collected for all samples to be utilized in case referee testing is required.

*Delete paragraph 2 in its entirety and replace with the following:*

HMA samples shall be randomly taken in the field by the Contractor as directed by the owner or representative using sample plates or other methods designated by the Owner or representative.

*Subsection 310.08.01 4th paragraph is amended by the addition of the following:*

The repair to the rejectable asphalt will be a minimum of 1 full lane width or the total width of paving done in echelon by a minimum length that is to be determined by the Contract Administrator.

*Subsection 310.08.01 is amended by the addition of the following:*

When initial representative hot mix samples fail to meet the mix design tolerance requirements, the Owner will investigate further with a second representative sample for re-testing. All costs associated with initial testing, and successful testing on the second representative sample is borne by the Owner. All costs associated with the failed second sample re-testing, further investigation (testing and subsequent testing), and remedial measures to correct outstanding deficiencies, will be charged to the Contractor. If the quality assurance and the quality control samples disagree, then the referee sample will take precedence without averaging the results of all sample results.



#### **310.08.04 Aggregate Gradation and Asphalt Cement Content Acceptance**

*Subsection 310.08.04 is amended by the following:*

Reference in paragraphs 1, 2 and 3 – amend Table 7 to read Table 7 of the City of London Supplemental Standards for Roads (SR) Specification 310.

A total of three consecutive borderline test results for asphalt cement content or air voids representing up to 5,000 tonnes of HMA production shall result in the work being deemed rejectable.

The repair to the rejectable asphalt will be the greater of a minimum of 1 full lane width or the total width of the paving done in echelon by the length of the HMA pavement that does not meet specification.

#### **310.08.05 Hot Mix Asphalt Properties Acceptance**

*Delete subsection 310.08.05 in its entirety and replace with the following:*

\* HMA refers interchangeably to Marshall mixes and Superpave mixes within this specification. Marshall Mixes are defined as: HL 8, HL 4, HL 3, HL 3A, HL1 (refer to Table 7, 8 and 9); and Superpave Mixes are defined as: SP 25, SP19, SP12.5, SP12.5FC1, SP12.5FC2 (refer Tables 7 and 9).

Marshall and Superpave test results for hot mix samples based on LS test procedures shall meet the requirements specified in Table 7, 8 and 9 (Marshall) and Table 7 and 9 (Superpave) of the City of London Supplemental Standards for Roads (SR). The production of air voids for ALL Marshall and Superpave mixes shall be evaluated according to Table 9 of the City of London Supplemental Standards for Roads (SR).

If the Marshall mixes do not meet Table 7 for AC or the Table 8 specifications for Marshall stability or Marshall flow, or if the Marshall and Superpave mixes are deemed borderline/rejectable for air voids according to Table 9, the deficient area shall be deemed to be the area from the failed sample locations to an acceptable sample location or the limits of the project if no other sample is between it and the limits. The Contract Administrator may reduce the limits of borderline/rejected HMA that has been placed at their discretion. Referee samples within the limits of the affected areas shall be delivered by the Contract Administrator to a mutually agreed upon third party referee laboratory to verify aggregate gradation and Marshall properties or Superpave consensus properties, as appropriate. Referee samples shall have all mix properties tested for compliance. When the results from the referee samples do not meet Table 7 for AC or the Table 8 (Marshall) requirements or are deemed borderline/rejectable according to Table 9 (Marshall & Superpave), the HMA pavement shall be removed if rejectable and replaced with acceptable HMA or be subject to a cost reduction if borderline in accordance with Table 9 (Marshall & Superpave). Alternatively, the Contract Administrator may accept a guaranteed maintenance bond, an increased maintenance period, or a negotiated price adjustment.

If the HMA is borderline for both air voids and asphalt cement content at opposite ends of the spectrum, the HMA may be deemed rejectable or subject to a cost reduction at the Owner's discretion.

In order to determine the exact limits of rejectable HMA, the Contractor may at their discretion and cost take additional slab samples at minimum 100m intervals. The slab samples shall only be taken between a passing sample and a rejectable sample. The initial slab sample must be taken a minimum of 100m from the failed sample. The test results must be received prior to a subsequent slab sample being taken. If two adjacent samples failed, no additional testing in between the two will be permitted. The sampling shall be

witnessed by the Owner's Representative and shall be tested by the Referee Laboratory at the Contractor's cost.

The repair to the rejectable asphalt will be the greater of a minimum of 1 full lane width or the total width of the paving done in echelon by the length of the HMA pavement that does not meet specification.

### **310.08.06                    Compaction Requirements**

#### **310.08.06.02              Compaction Determined by Nuclear Density Gauge**

*Amend first paragraph to read:*

Compaction testing shall be conducted randomly at a frequency determined by the Owner.

*Subsection 310.08.06.02 is amended by the addition of the following:*

Testing by an independent third-party referee laboratory may be invoked either by the Contractor or the Contract Administrator. All costs associated with successful first and second attempt hot mix compaction testing shall be borne by the Corporation. Costs associated with unsuccessful second attempt compaction tests and all subsequent testing will be charged to the Contractor.

##### **310.08.06.02.01        Marshall Hot Mix Asphalt**

*Subsection 310.08.06.02.01 is amended by the addition of the following:*

The repair to the rejectable asphalt will be the greater of a minimum of 1 full lane width or the total width of the paving done in echelon by a length of HMA represented by the test.

##### **310.08.06.02.02        Superpave Hot Mix Asphalt**

*Subsection 310.08.06.02.02 is amended by the addition of the following:*

The repair to the rejectable asphalt will be the greater of a minimum of 1 full lane width or the total width of the paving done in echelon by a length of HMA represented by the test.

### **310.09                    Measurement for Payment**

#### **310.09.01                Actual Measure**

Subsection 310.09.01 is amended by the addition of the following:

##### **310.09.01.04            Core Samples**

Core samples taken shall be paid for by the unit each.

##### **310.09.01.05            Painting Edge of Concrete Curb and Gutter Reveal**

Painting the exposed edge of the concrete curb and gutter reveal shall be included in the cost of supplying and placing base asphalt or in the cost to remove asphalt by milling.



### 310.09.01.06 Asphalt Ramping

Asphalt ramping at all wheel chair accesses, intersecting side streets will be included in the cost of supplying and placing base asphalt.

The removal of the asphalt ramps by milling shall be included under the appropriate item "Remove Asphalt by Milling".

### 310.10 Basis of Payment

*Sub-section 310.10.01 is extended by the addition of the following:*

Payment for painting edge of concrete curb and gutter reveal shall be included in the price of base asphalt and shall be full compensation for all labour, equipment and material required to complete the necessary work.

Payment for asphalt ramping shall be included in the price of base asphalt and shall be full compensation for all labour, equipment and material required to complete the necessary work.

### 310.10.04 Payment Adjustment for Changes in the MTO Performance Graded Asphalt Cement Price Index

The Contract Administrator shall make an Asphalt Cement Payment Adjustment to reflect OHMPA formula which states:

The payment adjustment per tonne will apply to the quantity of asphalt cement in the hot mix accepted into the work during the month for which it is established.

The payment adjustment for the month will be calculated by the following:

1. **When AC Prices are Rising** by more than a \$15.00/tonne: The payment adjustment to be paid to the Contractor is the result of subtracting the price index for the month prior to tender opening from the price index in effect when paving takes place, minus the \$15.00 float, multiplied by the number of tonnes of PGAC incorporated in the mix(s) as determined by the job mix formula. Taxes on the adjustment will be included.
2. **When AC Price are Falling** by more than \$15.00/tonne: the payment adjustment made in favour of the Owner is the result of subtracting the price index in effect when paving takes place, plus the \$15.00 float from the price index for the month prior to the tender opening, multiplied by the number of tonnes of PGAC incorporated in the mix (s) as determined by the job mix formula. Taxes on the adjustment will be included.

Link to MTO AC Price Index: <http://www.onasphalt.org/mtopriceindex/>

A mark up on the Payment Adjustment will not apply to the asphalt Cement Payment Adjustment.

## TABLES

**TABLE 6 Sampling and Testing Frequency of Hot Mix Asphalt**

Delete Table 6 (O.P.S.S.) and replace with the following table:

Frequency of Sampling and Testing
One sample per 500 tonnes or part thereof, minimum of two and minimum of one per direction of travel

**TABLE 7 Tolerances for the Job-Mix Formula Aggregate Gradation and Asphalt Cement Content**

Delete Table 7 (O.P.S.S.) and replace with the following table:

### Tolerances for the Job-Mix Formula Aggregate Gradation and Asphalt Cement Content

Mix	Attributes	Tolerances on the Job Mix Formula, Borderline	Tolerances on the Job Mix Formula, Rejectable
Surface Course	DLS, 4.75 mm Sieve Size	N/A	>7.5%
Surface Course	600 µm Sieve Size	N/A	>5.0%
Surface Course	75 µm Sieve Size	N/A	>3.0%
Binder and Leveling Course	DLS, 4.75 mm Sieve Size	N/A	>10.0%
Binder and Leveling Course	600 µm Sieve Size	N/A	>6.0%
Binder and Leveling Course	75 µm Sieve Size	N/A	>3.0%
All Mixes	Asphalt Cement Content	0.30 to 0.50	>0.50%

**Note:** Tolerances on the job-mix formula apply as both plus and minus from the job-mix formula percent.

**TABLE 8 Marshall Stability and Flow Properties for Hot Mix Asphalt Types**

Delete Table 8 (O.P.S.S.) and replace with the following table.

<b>Marshall Stability and Flow Properties for Hot Mix Asphalt Types</b>		
<b>Mix</b>	<b>Attributes</b>	<b>Rejectable Range</b>
HL3	Minimum Marshal Stability Newtons (N) @ 60oC LS-267 and LS-263	<8,900 N
HL8	Minimum Marshal Stability Newtons (N) @ 60oC LS-267 and LS-264	<8,900 N
HL4	Minimum Marshal Stability Newtons (N) @ 60oC LS-267 and LS-265	<8,900 N
HL3F	Minimum Marshal Stability Newtons (N) @ 60oC LS-267 and LS-266	<5,800 N
HL3	Marshall flow at 3.5% air voids: LS-267 and LS-263	<8.0 and >14.0
HL4	Marshall flow at 3.5% air voids: LS-267 and LS-264	<8.0 and >14.0
HL8	Marshall flow at 3.5% air voids: LS-267 and LS-265	<8.0 and >14.0
HL3F	Marshall flow at 3.5% air voids: LS-267 and LS-266	<9.0 and >18.0

Notes: Stability requirements shall be according to **OPSS.MUNI 1150**

**TABLE 9 Air Void Criteria for Hot Mix Asphalt Types (LS-265)**

Delete Table 9 (O.P.S.S.) and replace with the following table.

<b>Air Void Criteria for Hot Mix Asphalt Types (LS-265)</b>				
<b>Mix</b>	<b>Acceptable %</b>	<b>Borderline % (notify Contractor)</b>	<b>Borderline % (5% payment reduction for each 0.1% into this range)</b>	<b>Rejectable (removal and replacement) %</b>
All Mixes	3.0 to 5.0	≥ 2.8 to < 3.0 and > 5.0 to ≤ 5.2	≥ 2.5 to < 2.8 and > 5.2 to ≤ 5.5	< 2.5 and > 5.5

### **331 Construction Specification for Full Depth Reclamation with Expanded Asphalt Stabilization**

#### **331.10 Basis of Payment**

*Section 331.10 is amended by the addition of the following:*

##### **331.10.02 Asphalt Cement Payment Adjustment**

The Contract Administrator shall make an Asphalt Cement Payment Adjustment to reflect OHMPA formula which states:

The payment adjustment per tonne will apply to the quantity of asphalt cement in the hot mix accepted into the work during the month for which it is established. The payment adjustment for the month will be calculated by the following:

1. **When AC Prices are Rising** by more than a \$15.00/tonne: The payment adjustment to be paid to the Contractor is the result of subtracting the price index for the month prior to tender opening from the price index in effect when paving takes place, minus the \$15.00 float, multiplied by the number of tonnes of PGAC incorporated in the mix(s) as determined by the job mix formula. Taxes on the adjustment will be included.
2. **When AC Price are Falling** by more than \$15.00/tonne: The payment adjustment made in favour of the Owner is the result of subtracting the price index in effect when paving takes place, plus the \$15.00 float from the price index for the month prior to the tender opening, multiplied by the number of tonnes of PGAC incorporated in the mix (s) as determined by the job mix formula.

Taxes on the adjustment will be included.

Link to MTO AC Price Index: <http://www.onasphalt.org/mtopriceindex/>

A mark up on the Payment Adjustment will not apply to the asphalt Cement Payment Adjustment.

Payment adjustment may result in additional compensation to the Contractor or a rebate to the Owner. A markup will not apply to the Asphalt Cement Payment Adjustment.

### **333 Construction Specification for Cold in-Place Recycled Mix**

#### **333.10 Basis of Payment**

*Section 333.10 is amended by the addition of the following:*

##### **333.10.02 Asphalt Cement Payment Adjustment**

The Contract Administrator shall make an Asphalt Cement Payment Adjustment to reflect OHMPA formula which states:

The payment adjustment per tonne will apply to the quantity of asphalt cement in the hot mix accepted into the work during the month for which it is established.

The payment adjustment for the month will be calculated by the following:

1. **When AC Prices are Rising** by more than a \$15.00/tonne: The payment adjustment to be paid to the Contractor is the result of subtracting the price index for the month prior to tender opening from the price index in effect when paving takes place, minus the \$15.00 float, multiplied by the number of tones of PGAC incorporated in the mix(s) as determined by the job mix formula. Taxes on the adjustment will be included.
2. **When AC Price are Falling** by more than \$15.00/tonne: the payment adjustment made in favour of the Owner is the result of subtracting the price index in effect when paving takes place, plus the \$15.00 float from the price index for the month prior to the tender opening, multiplied by the number of tonnes of PGAC incorporated in the mix (s) as determined by the job mix formula.

Taxes on the adjustment will be included.

Link to MTO AC Price Index: <http://www.onasphalt.org/mtopriceindex/>

A mark up on the Payment Adjustment will not apply to the asphalt Cement Payment Adjustment.

Payment adjustment may result in additional compensation to the Contractor or a rebate to the Owner. A markup will not apply to the Asphalt Cement Payment Adjustment.

## **350 Construction Specification for Concrete Pavement and Concrete Base**

### **350.05 Materials**

#### **350.05.01 Concrete**

*Subsection 350.05.01, paragraph a) is deleted in its entirety and replaced by the following:*

- a) The nominal maximum size of the coarse aggregate for concrete pavement shall be 19.0 mm with gradation requirements as per Table 3 of O.P.S.S. 1002.

### **350.07 Construction**

#### **350.07.02 Joints**

##### **350.07.02.01 General**

*Clause 350.07.02.01, first paragraph, is deleted in its entirety and replaced by the following:*

Although the joint types and locations may be shown on the Contract Drawings, the Contractor shall submit a joint layout for approval prior to placing either curb and gutter or concrete pavement or both.

*Clause 350.07.02.01 is amended by the addition of the following:*

Transverse joint layout should begin by planning joints to intercept roundouts for CB's and MH's. The center line of road distance between ends shall be divided into panels with a maximum length of either 30 times the pavement thickness or 4.5m, whichever is less.

Transverse joints shall have a depth not less than 1/4 the slab thickness and be continuous through the curb.

Longitudinal joint spacing shall not exceed 3.8m. Sawn longitudinal joints should be cut to 1/3 the pavement thickness.

#### **350.07.02.04 Position and Alignment Tolerances**

##### **350.07.02.04.02 Joints**

*Clause 350.07.02.04.02 Joints is deleted in its entirety and replaced by the following:*

All joints shall be placed within a tolerance of +/-15mm from the design location shown on the saw cut construction drawing, or from some other location required by the Contract Administrator.

#### **350.07.03 Concreting**

##### **350.07.03.02 Finishing**

*Clause 350.07.03.02 is amended by the addition of the following:*

Following strike-off and consolidation, the concrete pavement shall be scraped with an aluminum or magnesium straight-edge, 3 meters wide, equipped with a handle to permit operation from the edge of pavement. Any excess water or latency shall be removed from the surface before scraping.

#### **350.07.05 Joint Sealing**

*Section 350.07.05 is amended by the addition of the following:*

Cold Poured Joint Sealant: Apply joint sealant Dow 888 or equivalent in accordance with the manufacturer's recommendations.

Use Cold Poured Joint Sealant for the construction of concrete pavement.

#### **350.07.08 Sampling and Testing**

##### **350.07.08.01 Slump and Air Content**

*Clause 350.07.08.01, first paragraph, is deleted in its entirety and replaced by the following:*

Field sampling and testing of plastic concrete for conformance to surface tolerance, slump and air content shall be undertaken by the Owner.

**350.07.08.02      Coring**

*Clause 350.07.08.02 is deleted in its entirety and replaced by the following:*

When required or directed by the Contract Administrator, coring shall be carried out when the concrete or lean concrete is 28 to 35 days old. The Contractor shall cut a core in the location(s) designated by the Contract Administrator. The core shall be 100 mm in diameter and shall be drilled through the complete depth of concrete pavement, concrete base or lean concrete base, perpendicular to the surface of the slab.

**350.07.08.05      Transportation of Cores**

*Clause 350.07.08.05 is deleted in its entirety and replaced by the following:*

The concrete cores shall be delivered by the Contract Administrator to a laboratory designated by him on the same day they were obtained.

**350.08              Quality Assurance**

**350.08.01          Acceptance Criteria for Strength and Thickness**

**350.08.01.01      General**

*Clause 350.08.01.01 is deleted in its entirety and replaced by the following:*

Slab thickness and core and/or cylinder compressive strength shall be the basis for acceptance of concrete pavement, concrete base and lean concrete bases.

**350.08.01.03      Lot Size**

*Clause 350.08.01.03 is deleted in its entirety.*

**350.08.01.03.01   Compressive Strength and Thickness**

*Clause 350.08.01.03.01, first and second paragraph is deleted in its entirety and replaced by the following.*

When concrete cylinders are tested for compression, the compressive strengths will be calculated in accordance with CAN/CSA-A23.1-M90 Section **17.5.7.1**.

CAN/CSA-A23.1-M90 Section **17.5.7**      Compressive Strength Requirements

CAN/CSA-A23.1-M90 section **17.5.7.1**      Standard Cured Cylinders

The strength level of each class of concrete shall be considered satisfactory if the averages of all sets of three consecutive strength tests for that class at one age equal or exceed the specified strength, and no individual strength test is more than 3.5 MPa below the specified strength. These requirements shall not apply to field-cured specimens.



**Notes:**

- 1) With the standard deviation designated "s", these criteria can be expected to be met 99% of the time if the concrete is proportioned to produce an average strength as follows:
  - a) 1.4 times the standard deviation (1.4 s) above the specified strength when the standard deviation (s) is not more than 3.5 MPa; and
  - b) times the standard deviation minus 3.5 MPa (2.5 - 3.5 MPa) above the specified strength when the standard deviation (s) is not more than 3.5 MPa.
- 2) The standard deviation used in Note 1 should be based on at least 30 consecutive strength tests, representing concrete whose design strength is within 7 MPa of that required for the work made with similar materials and under similar conditions to those expected.
- 3) Individual tests from concrete meeting these requirements can be expected to be below specified strength about 10% of the time.
- 4) For high-strength concrete different acceptance criteria will be specified by the Owner.

**350.08.01.05      Removal of Unacceptable Concrete**

*Clause 350.08.01.05, first paragraph, is amended to read:*

If the mean core compressive strength and/or deficiency in the thickness of the concrete pavement slab dictates removal or replacement, the Contractor will receive written instruction from the Contract Administrator to correct the deficient area(s).

*Clause 350.08.01.05, second and fourth paragraphs are deleted in their entirety.*

**350.09              Measurement for Payment**

**350.09.01          Actual Measurement**

**350.09.01.01      Concrete Pavement, Concrete Base**

*Clause 350.09.01.01 is amended by the addition of the following:*

If the concrete curb and gutter is poured monolithically (as part of the road slab), width measurements will be taken from back of curb to back of curb minus two times the width of the specified type of curb and gutter.

The curb and gutter area will be measured in accordance with O.P.S.S. 353.09.01.01.

**350.09.02          Plan Quantity Measurement**

*Clause 350.09.02.01 is deleted in its entirety.*



**350.10 Basis of Payment**

**350.10.01 Concrete Pavement – Item  
Concrete Base – Item**

*Subsection 350.10.01 is deleted in its entirety and replaced by the following:*

Payment at the contract price for the above items shall be full compensation for all labor, equipment and material required to do the work.

**350.10.01.01 Compressive Strength and Slab Thickness**

*Clause 350.10.01.01 is deleted in its entirety.*

**351 Construction Specification for Concrete Sidewalk**

**351.05 Materials**

**351.05.06 Tactile Walking Surface Indicator Plates**

*Subsection 351.05.06 of OPSS 351 is deleted and replaced by the following:*

Gray cast iron Tactile walking surface indicator plates shall be as specified in the Contract Documents. Castings shall be according to ASTM A 48M, Class 35B and either powder coated Brick Red or Bare (not coated with other coatings or substances). Castings shall be free from pouring faults, cracks, blowholes and other defects.

The surface of each new cast iron plate on both the tops of the truncated domes and the field between the truncated domes shall have minimum wet dry coefficient of friction of 0.8 according to ASTM C 1028.

Mixing of powder coated Brick Red or Bare castings within the same ramp is not permitted

Each square cast iron plate shall be 600mm x 600mm in size and installed as per the layouts detailed in STS-11.09.

Use of radius style plates are permitted at the discretion of the Contract Administrator or as specified in Contract Drawings but shall be installed as a continuous line of plates in the ramped portion of the sidewalk that follow the curb radii at an equal distance of no more than 200mm from the back of the curb with no gaps between any plates.

**351.07 Construction**

**351.07.01 General**

*Subsection 351.07.01 is amended by the addition of the following:*

For contracts dealing with the construction of sidewalks only, excavation outside of the nominal two-meter limit centered along the proposed sidewalk location will be a separate item in the Form of Tender termed "LANDSCAPE GRADING". This excavation will consist of landscape grading of lawns,

boulevards or any other area adjacent to the proposed sidewalk.

**351.07.02 Grading Tolerances**

**351.07.02.02 Granular Base**

*Subsection 351.07.02.02 is amended by the addition of the following:*

Granular Base shall be a minimum of 100 mm for the construction of new or replacement sidewalks.

**351.07.06 Utility Adjustment**

*Subsection 351.07.06, second paragraph, first sentence is amended to read:*

Appurtenances maintained and owned by utility companies other than the Owner shall either be adjusted by the utility company concerned or by the Contractor (with approval from the applicable utility company). All arrangements to adjust the utility appurtenance shall be approved by the Contract Administrator.

**351.07.11 Joints**

**351.07.11.04 Expansion Joints**

*Subsection 351.07.11.04, 3rd paragraph is amended by the addition of the following:*

Expansion Joints shall be placed every 5th sidewalk panel.

**351.07.12 Identification Stamp**

*Subsection 351.07.12 is deleted in its entirety and replaced by the following:*

The Contractor at their own discretion and expense may clearly and legibly mark with an approved stamp, only at each end of the work. The stamp shall be located on the center of the bay, next to and parallel to a transverse joint.

**351.07.16 Protection of Sidewalk**

*Subsection 351.07.16 is deleted in its entirety and replaced by the following:*

New sidewalk surfaces shall be protected from damage of any kind. Vehicular and pedestrian traffic will not be permitted to travel on or across the new sidewalk surfaces until approved by the Contract Administrator.

**351.09 Measurement for Payment**

**351.09.01 Actual Measurement**

*Section 351.09.01 is amended by the addition of the following:*

**351.09.01.03 Excavation**

For contracts dealing with the construction of sidewalks only, measurement of concrete sidewalk excavation will be contained within a nominal width of two meters centered on the proposed sidewalk location.

All materials actually excavated in cut will be measured in cubic meters from the existing ground profile down to the earth sub-grade. All sidewalk earth excavation will be constructed in accordance with O.P.S.S. 206.

The areas of "LANDSCAPE GRADING" beyond the two-meter limit will be measured and computed in square meters for any depth required to establish grade, to the satisfaction of the Contract Administrator.

**351.10 Basis of Payment**

**351.10.03 Excavation**

*Subsection 351.10.03 is amended by the addition of the following:*

Payment at the contract price for the tender item(s) "EARTH EXCAVATION, LANDSCAPE GRADING AND/OR ROCK EXCAVATION" shall be full compensation for all labour, equipment and material to do the work, including placement and disposal of surplus acceptable and unacceptable material.

**353 Construction Specification for Concrete Curb and Gutter Systems**

**353.07 Construction**

**353.07.12 Catch Basin and Maintenance Hole Frame and Grates**

*Subsection 353.07.12 is amended by the addition of the following:*

A concrete curb setback is required for all catch basins and curb inlet catch basin located on the right of ways. Refer to City of London SR 3.0. Concrete curb setbacks shall not be implemented when curb face sidewalk is specified.

**353 Construction Specification for Concrete Curb and Gutter Systems**

**353.07 Construction**

**353.07.12 Catch Basin and Maintenance Hole Frame and Grates**

*Subsection 353.07.12 is amended by the addition of the following:*

A concrete curb setback is required for all catch basins and curb inlet catch basin located on the right of ways. Refer to City of London SR 3.0. Concrete curb setbacks shall not be implemented when curb face sidewalk is specified.

**353.09 Measurement for Payment**

**353.09.01 Actual Measurement**

*Clause 353.09.01 is amended by the addition of the following:*

**353.09.01.04 Concrete Curb and Gutter Concrete Curb Setbacks**

Measurement for the item "CONCRETE CURB SETBACKS" in the Form of Tender will be for the actual number of curb setbacks constructed (each).

## **353.10 Basis of Payment**

### **353.10.01 Concrete Curb and Gutter – Item Concrete Spillways – Item Concrete Gutter Outlets – Item**

*Subsection 353.10.01 is amended by the addition of the following:*

Concrete Curb Setbacks – Item

Note: The following Ontario Provincial Standard Drawings for Concrete Curb and Gutter have been selected for use on all design, construction and reconstructive maintenance projects of the City's infrastructure, including new subdivisions and developments, unless specified on Contract Drawings and Special Provisions.

OPSD 600.01	Concrete Barrier Curb with Wide Gutter
OPSD 600.04	Concrete Barrier Curb with Standard Gutter
OPSD 600.06	Concrete Semi-Mountable with Standard Gutter

Note: Exclude the note on Drawing 600.060 that references "Drop Curb at Entrances Typ." except at pedestrian crosswalks/ramps and mailbox locations where the mailboxes are facing the street.

Note: The construction notes "thickness of adjacent sidewalk" made to the dimension between the top of curb and the top of the concrete key, on the back of the curb, should read "thickness of adjacent sidewalk and island cap" for OPS drawings 600.01 and 600.04 noted above.

## **501 Construction Specification for Compacting**

### **501.07 Construction**

#### **501.07.01 General**

*Subsection 501.07.01 is amended by the addition of the following:*

"Jetting" is not an approved method of compaction unless it is carried as a "Special Provision" in the Contract Document, or as directed by the Contract Administrator.

### **501.08 Quality Assurance**

#### **501.08.01 General**

*Subsection 501.08.01 is amended by the addition of the following:*

All costs associated with successful first and successful second attempt compaction testing shall be borne by the Corporation. Costs associated with unsuccessful second attempt compaction tests and subsequent testing will be charged to the Contractor.

#### **501.08.02 Method A**

*Subsection 501.08.02 is amended by the addition of the following to the first paragraph:*

Trench backfill material placed in a zone from 1.0 meters below road sub-grade, to road sub-grade, shall be compacted to a minimum density of 98% of the maximum dry density.

## **510 Construction Specification for Removal**

### **510.03 Definitions**

"Asphalt Pavement" means all bituminous surface treated materials, and Hot Mix H.L. materials (all types).

### **510.07 Construction**

#### **510.07.06.03 Removal of Pavement, Treated Base and Concrete Base**

*Subsection 510.07.06.03, first paragraph, last sentence, is deleted and replaced by the following:*

Such materials shall be removed from the contract site and disposed of outside the right-of-way at locations arranged for by the Contractor at the Contractor's expense

#### **510.07.06.04 Removal of Asphalt Pavement Partial - Depth**

*Subsection 510.07.06.04, first paragraph, second sentence, is deleted in its entirety and replaced by the following:*

Such materials shall be removed from the contract site and disposed of outside the right-of-way at locations arranged for by the Contractor at the Contractor's expense.

*Subsection 510.07.06.04 is amended by the addition of the following:*

In preparation to placing top asphalt, the milling of end joints at the limits of construction and at side streets must be completed when asphalt is to be placed within 24 hours.

### **510.07.10 Management of Excess Material**

*Subsection 510.07.10 is deleted in its entirety and replaced with the following:*

Excess materials or materials unsuitable for the Contract will be removed from the contract site and disposed of outside the right-of-way at locations arranged for by the Contractor. Payment will be in accordance with GC8.02.02, paragraph .02).

### **510.09 Measurement for Payment**

#### **510.09.01 Actual Measurement**

##### **510.09.01.06 Removal of Pipes and Culverts**

*Subsection 510.09.01.06 is amended by the addition of the following:*

Reference the City of London Supplemental Standards for Roads OPSS amendment 180.07.01 for details on removing asbestos cement material.

## **706 Construction Specification for Temporary Traffic Control Devices**

### **706.07 Construction**

#### **706.07.01.02 Existing Small Signs**

*Subsection 706.07.01.02 is deleted in its entirety and replaced with the following:*

Prior to commencement of construction, the Contractor must record the location and type of each sign within the limits of the construction. The Contractor is responsible for removal, storage and reinstallation of all signs within the construction zone including the cost of replacing missing signs as a result of construction or theft. The signs must be reinstalled conforming to the Ontario Traffic Manual, Highway Traffic Act, City of London's Traffic and Parking By-Law and City of London Standards. Temporarily relocated existing signs shall be kept at the same height, offset and basic location from traffic as before removal. All new or replacement signs required as part of the works will conform to requirements for the appropriate sign type (post type, material, reflectivity, etc.) as detailed on drawings SR-19.0 to SR-19.4, inclusive.

## **710 Construction Specification for Pavement Marking**

### **710.04 Design and Submission Requirements**

#### **710.04.01 General**

*Subsection 710.04.01, first paragraph, is deleted in its entirety and replaced by the following:*

At the request of the Contract Administrator, the Contractor shall supply and deliver a sample of the pavement marking material specified in the contract to a designated lab for testing. An adequate amount of binder, activator, pigment, inert filler content and reflectorizing glass beads to produce a one-litre sample of extruded hydrocarbon thermoplastic or extruded two-component cold plastic; a one-litre sample of solvent-based and/or water-borne paint; one metre sections of preformed pavement tape as specified in the contract shall be delivered to the designated lab at the Contractor's expense.

### **710.05 Materials**

#### **710.05.03 Thermoplastic Pavement Marking Materials**

*Subsection 710.05.03 is amended by the addition of the following:*

Thermoplastic pavement marking shall also conform to the requirements of Lafrentz "300 Series".

#### **710.05.04 Field Reacted Polymeric Pavement Marking Materials**

*Subsection 710.05.04 is amended by the addition of the following:*

Field reacted polymeric pavement marking material shall also conform to the requirements of Lafrentz "System 400".

## **710.05.05                      Preformed Plastic Pavement Marking Tape**

*Subsection 710.05.05 is amended by the addition of the following:*

Preformed plastic pavement marking tape shall also conform to the requirements of 3M Stamark Series “440, 5730 and 5731.”

## **710.06                              Equipment**

*Amended as follows:*

All references to MUTCD are to be referenced to the most current version of OTM Book 11.

## **710.07                              Construction**

*Amended as follows:*

All references to MUTCD are to be referenced to the most current version of OTM Book 11.

## **710.07.08                      Selection of Materials**

*Subsection 710.07.08, paragraphs one to four inclusive are deleted in their entirety and replaced by the following:*

When the item “Permanent Pavement Marking” is called for in a contract, the Contractor shall choose from one of the following:

- a) Lafrentz “System 400” cold plastic
- b) Lafrentz “300 Series” inlaid thermo
- c) 3M Stamark Series 5730 and 5731 for lane lines, edge lines, and channelizing lines
- d) 3M Stamark Series A440 for stop bars, pedestrian crossings at intersections, and pedestrian crossovers (PXO)
- e) 3M Stamark Series 5730 for legends and symbols unless otherwise specified by the Contract Administrator.

All Ladder (zebra) pavement markings and green surface treatment (for bike lanes) shall have a skid resistance between 50BPN and 65BPN.

## **710.07.09                      Application**

### **710.07.09.01              General**

*Subsection 710.07.09.01 is amended by the addition of the following:*

Permanent pavement markings shall be placed within 24 hours after the surface asphalt has been completed. Working days will continue to be counted until the permanent pavement markings have been completed.

Permanent pavement markings including symbols on surface asphalt shall extend to 20 meters beyond



the limits of new asphalt to refresh the existing markings marred by tack coat, or as directed by the Contract Administrator or shown on the pavement markings drawing(s).

**710.09 Measurement for Payment**

**710.09.01 Actual Measurement**

**710.09.01.01 Pavement Marking**  
**Pavement Marking, Durable**  
**Pavement Marking, Temporary**  
**Pavement Marking, Temporary - Removable**  
**Pavement Marking Obliterating**

*Subsection 710.09.01.01 is deleted in its entirety and replaced by the following:*

All pavement marking lines shall be paid by the horizontal length in metres (excluding gaps), as specified in the Form of Tender.

**802 Construction Specification for Topsoil**

**802.07 Construction**

**802.07.03 Placement of Topsoil**

*Subsection 802.07.03, paragraph is deleted in its entirety and replaced by the following:*

Topsoil shall be spread to a uniform depth of 100 mm on designated areas.

**802.09 Measurement for Payment**

**802.09.01.01 Topsoil from Stockpiles**

*Subsection 802.09.01.01 is deleted in its entirety and replaced by the following:*

Where topsoil is to be placed and drawn from stockpiles built by the Contractor or from existing stockpiles designated in the Contract, measurement will be made in square metres of topsoil placed.

**802.09.01.02 Topsoil, Imported**

*Subsection 802.09.01.02 is deleted in its entirety and replaced by the following:*

Where topsoil is to be imported and placed, measurement will be made in square metres of topsoil placed.

**803 Construction Specification for Sodding**

**803.07 Construction**

**803.07.04 Placement of Sod**

*Subsection 803.07.04 is amended by the addition of the following:*



Butt joints will be used where new sod blends with existing grass; lap joints will not be permitted. New sod should be substituted with hard surface materials, as per the layout plans, if the shortest dimension of the sodded area is less than 0.5m.

### **803.07.05 Maintenance of Completed Sodding**

*Subsection 803.07.05 is deleted in its entirety and replaced by the following:*

The Contractor shall maintain the new sod for 30 Days following completion of sod placement. During this period the Contractor shall ensure that all placed sod is kept healthy, actively growing and green in colour. The sod shall be watered within 1 hour of being laid and kept moist to a depth of 100mm.

The Contractor shall apply water to new sod a minimum of 3 times during the 30-day period.

The Contractor is responsible to mow all new sod for the 30-day period and shall not allow the sod grow longer than 100mm. The grass shall not be cut shorter than 65mm. The Contractor shall remove all clippings and maintain sodded area weed free. The Contractor shall notify the residents that they are not to mow the new sod until after the 30-day period.

At the end of the 30-day period, the sod shall be green and succulent, and show evidence of rooting into the underlying soil. Any area of sod which fails to meet these requirements shall be replaced by the Contractor and shall be subject to a further extension of a 30-day maintenance period.

This requirement shall be suspended during the winter dormant period, November 15 to April 15, inclusive.

### **803.08 Quality Assurance**

#### **803.08.01 Performance Measure**

*Subsection 803.08.01 is deleted in its entirety and replaced by the following:*

At the end of the 30 consecutive day maintenance period, an inspection of all the sod placed shall be made by the Contract Administrator. All placed sod shall be green and succulent and show evidence of rooting into the underlying soil. All sod shall be in the same location as originally placed and shall not have moved, eroded, slipped or sloughed. Any areas which fail to meet these requirements shall be replaced by the Contractor and shall be subject to a further extension of a 30-day maintenance period.

### **803.10 Basis of Payment**

#### **803.10.01 Sod - Item**

*Subsection 803.10.01 is amended by the addition of the following:*

Water to establish sod growth throughout the 30-day period (ref. 803.07.05) and the mowing of the new sod is included in the price per square metre of sod placed/measured (ref.803.09.01.01). Any additional watering's beyond the 3 times included in the price per square metre will be paid for under an item "Water for Sod" The Owner or the Contract Administrator must be notified when the water is going to be applied.

## **805 Construction Specifications for Temporary Erosion and Sediment Control Measures**

### **805.05 Materials**

#### **805.05.02 Geosynthetics**

##### **805.05.02.05 Filter Bags**

*Subsection 805.05.02.05 is amended by the addition of the following:*

Geotextile for filter socks or filter bags shall be non-woven, polypropylene, Class I according to Table 1 of OPSS 1860.

Geotextile shall be free of holes, tears, and punctures.

Filter cloth is not an acceptable product.

Filter bags are to be placed in all existing catch basins and ditch inlet catch basins until drainage area has been fully stabilized, to the satisfaction of the Contract Administrator.

The curb inlet portion of the curb inlet catch basins shall be blocked from accepting flows until drainage area(s) are fully stabilized, to the satisfaction of the Contract Administrator.

Maintenance of the filter bags or filter socks shall be in accordance with the manufacture's specifications and to the satisfaction of the Contract Administrator.

Payment for this item shall be for each filter bag or filter sock, and shall include supply, installation, maintenance, removal and disposal of each filter bag or filter sock.

## **1003 Material Specification for Aggregates – Hot Mix Asphalt**

### **1003.05 Materials**

#### **1003.05.01 General**

*Subsection 1003.05.01, fourth paragraph, is deleted in its entirety and replaced by the following:*

Crushed slag produced from iron blast furnaces, nickel slag and steel slag shall be excluded from all hot mix materials and design mixes.

Aggregate from the Badgeley Island Quarry shall not be used in any asphalt mix in the City of London. The premium aggregate for HL1 surface asphalt shall be from a source on the MTO approved sources list.

**1003.05.03 Coarse Aggregates**

**1003.05.03.01 Gradation Requirements**

*Subsection 1003.05.03.01 is amended by the addition of the following:*

The grading requirement for 19.0 mm crushed stone shall meet the gradation requirements of Table 3, HL8 Coarse Aggregate.

**1101 Material Specification for Performance Graded Asphalt Cement**

**1101.08 Quality Assurance**

**1101.08.01 Basis of Acceptance**

Subsection 1101.08.01, paragraph 1 and 2 are deleted in its entirety and replaced with the following:

Acceptance of PGAC shall be based on QC test results submitted by the Contractor, subject to the conditions specified herein. The Owner shall designate the QC laboratory and be responsible for testing to determine whether the material meets the specification of the contract.

For acceptance purposes, tests shall be performed in accordance with Section 7 of AASHTO R 29. Samples for this testing shall be obtained in accordance with the Sampling subsection.

**1101.08.04 Quality Assurance Testing**

*Paragraph 1101.08.04 shall be deleted in its entirety and replaced with the following:*

Test samples for PGAC shall be based on the quantity of each grade of the product incorporated into the HMA and shall be determined by the Contract Administrator in consultation with the Contractor. Test Sample sizes shall be based on the total tender quantity of HMA.

**1150 Material Specifications for Hot Mix Asphalt**

**1150.04 Design and Submission Requirements**

**1150.04.01 Design Requirements**

**1150.04.01.01 Mixture Requirements for Design Purposes**

The mixture made during mix design shall be according to the requirements specified in the Tables 2, 3, 4, 5, 6 and 7.

MSM hot mix asphalt is not permitted. Shingles and modifiers are not permitted.

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**2501          Material Specification for Calcium Chloride****2501.09          Owner Purchase of Material****2501.09.01          Measurement and Payment**

*Subsection 2501.09.01.02 is amended by the addition of the following:*

Measurement for payment may also be measured by the number of 20 or 40 kg bags used on the construction site. The unit 20 or 40 kg bag shall be indicated in the Form of Tender.

## Standard Drawings for Roads

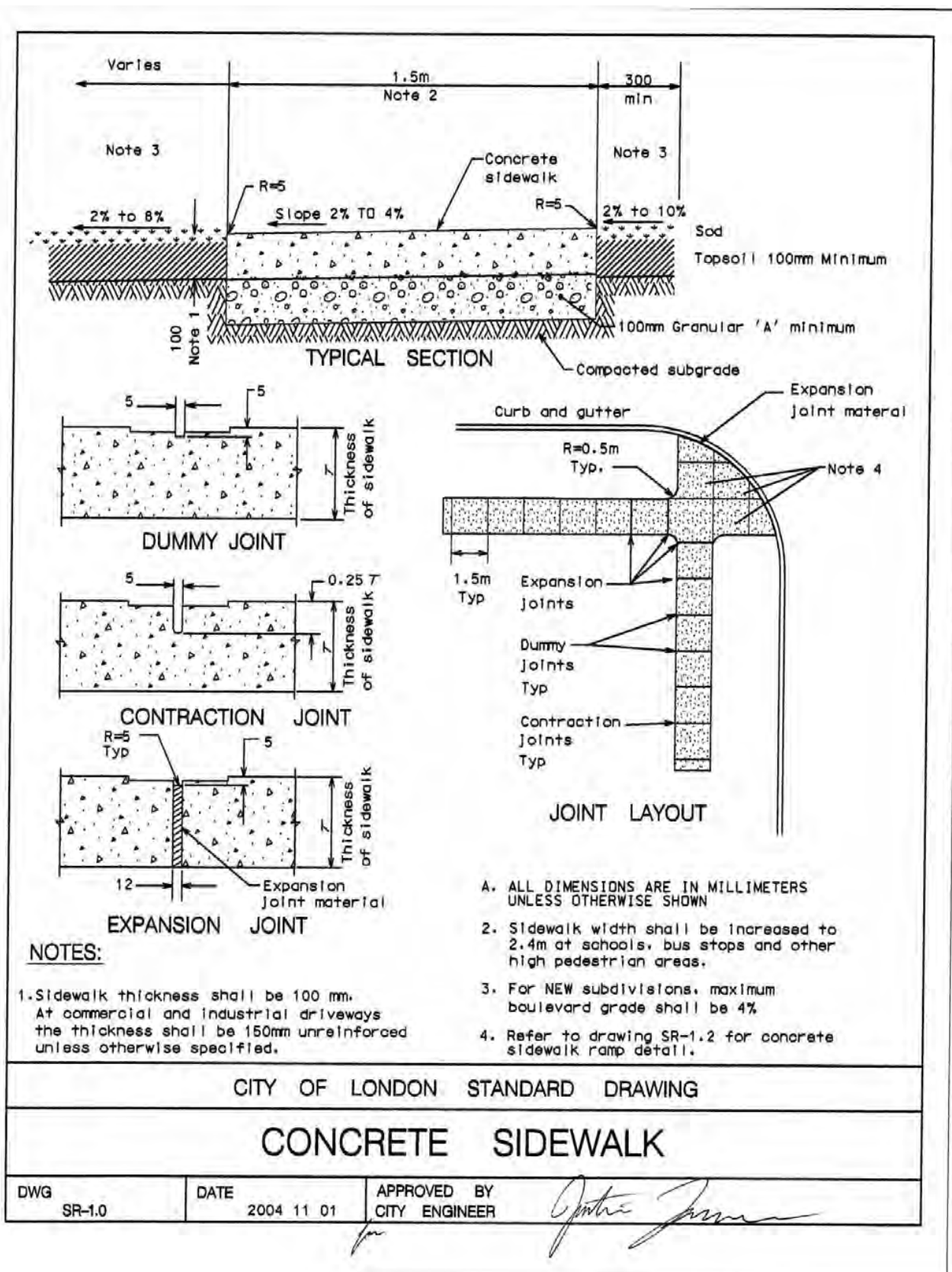
Volume 3 of the Ontario Provincial Standard Drawings (OPSD), and the current City of London Standard Contract Drawings are amended as follows:

Title of Drawing	Date of Drawing	City of London Drawing Classification	Ontario Provincial Standard Drawings	Date Drawing Superseded or Deleted	Old Drawing Title (if applicable)
Concrete Sidewalk	11/1/2004	SR-1.0	310.01	2/15/1997	Concrete Sidewalk
Concrete Sidewalk Adjacent to Curb and Gutter	12/11/2017	SR-1.1	310.01	1/30/1999	Concrete Sidewalk Adjacent to Curb and Gutter
Concrete Sidewalk Ramps	8/26/2011	SR-1.2	310.01	1/17/2003	Concrete Sidewalk Ramps
Combination Curb Face Sidewalk	12/11/2017	SR-1.3	310.01	3/1/1998	Combination Curb Face Sidewalk
Combination Curb Face Sidewalk at Driveways	12/11/2017	SR-1.4	310.01	2/15/1997	Combination Curb Face Sidewalk at Driveways
Sidewalk Driveway Entrance Detail	12/5/2017	SR-1.5	310.01	3/15/1996	Sidewalk Driveway Entrance Detail
Single Family and Multi-Family Driveway Entrances with Boulevards	11/3/2016	SR-2.0	-	3/6/2007	Single, Double and Multi-Family Driveway Entrances with Boulevards
Concrete Curb Setbacks	10/3/2014	SR-3.0	-	3/1/1998	Concrete Curb Setbacks
Asphalt Bicycle Path	08/19/2021	SR-4.0	-	11/1/2004	Asphalt Bicycle Path
Standard For Circular Cul-de-Sac	1/17/2003	SR-5.0	-	3/20/2002	Standard For Circular Cul-de-Sac
Standard For Industrial Cul-de-Sac	9/22/2010	SR-5.1	-	1/17/2003	Standard For Industrial Cul-de-Sac
Temporary Turning Circle	3/20/2002	SR-5.2	-	3/15/1996	Temporary Turning Circle

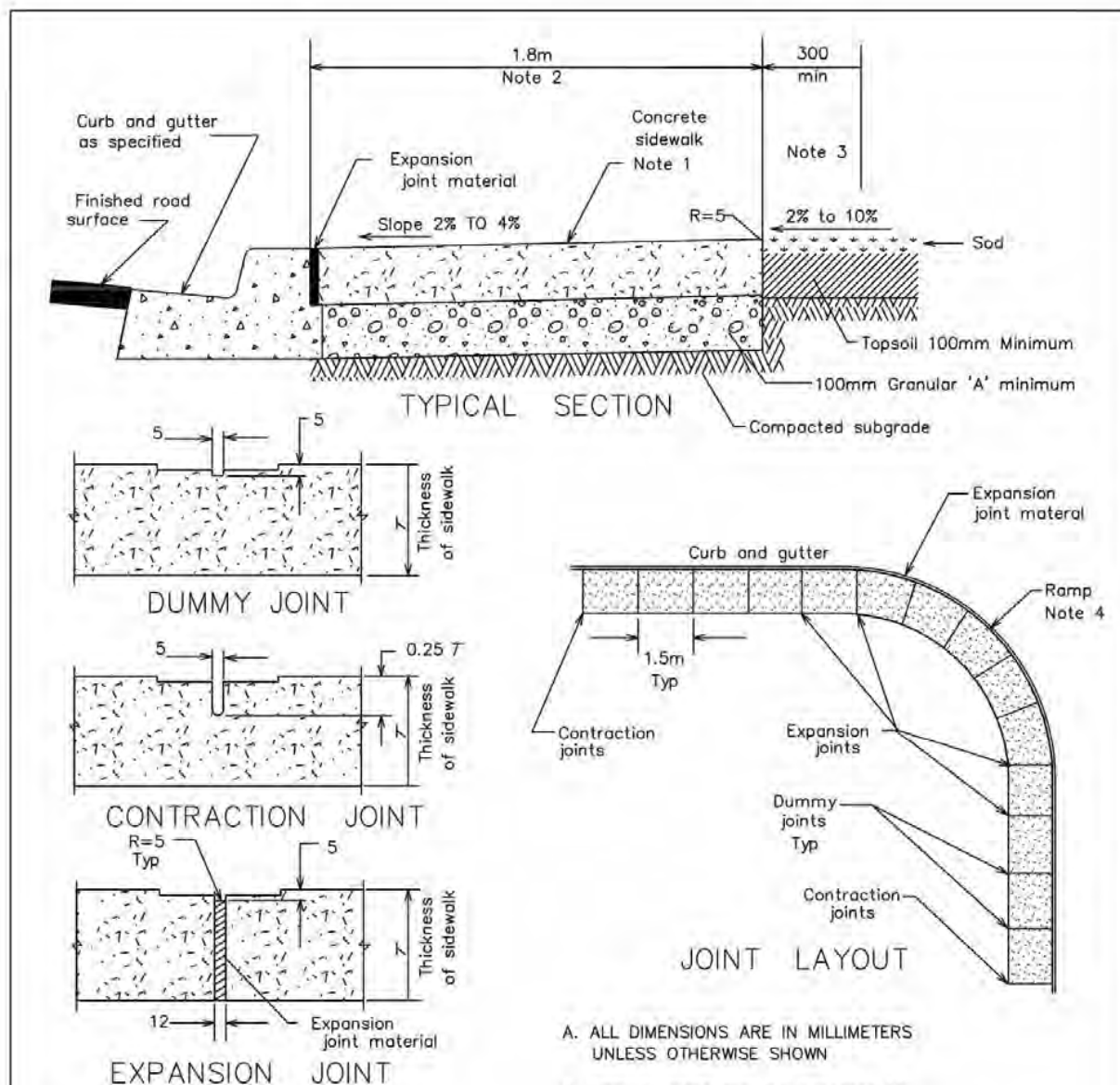
<b>Title of Drawing</b>	<b>Date of Drawing</b>	<b>City of London Drawing Classification</b>	<b>Ontario Provincial Standard Drawings</b>	<b>Date Drawing Superseded or Deleted</b>	<b>Old Drawing Title (if applicable)</b>
Concrete Steps with Footings	11/6/2002	SR-6.0	512.02	3/15/1996	Concrete Steps with Footings
Concrete Steps without Footings	11/6/2002	SR-6.1	-	3/15/1996	Concrete Steps without Footings
Standard Pedestrian Walkway	1/17/2003	SR-7.0	-	3/20/2002	Standard Pedestrian Walkway
Removable post Detail	3/15/1996	SR-8.0	-	-	-
Steel Beam Guide Rail Assembly Detail	3/1/1998	SR-9.0	-	-	-
Steel Beam Guide Rail Post and Offset Block Detail	3/1/1998	SR-9.1	-	-	-
Steel Beam Guide Rail Embedded Connection for New Structures	2/29/2000	SR-10.0	-	1/30/1999	Steel Beam Guide Rail Embedded Connection for New Structures
Existing Gravel Driveway Restoration	10/15/2013	SR-12.0	-	2/29/2000	Existing Gravel Driveway Restoration
Stepped Milled Joint Pavement Reinforcement Detail	10/15/2013	SR-13.1	-	1/26/2012	Stepped Milled Joint Pavement Reinforcement Detail
Pavement Cut Guidelines Matching New Construction to Existing Asphalt	9/22/2010	SR-14.0	-	10/26/2009	Pavement Cut Guidelines Matching New Construction to Existing Asphalt
Concrete Island Bullnose	12/3/2012	SR-19.0	-	-	-
Typical LI-Channel Post and Stabilizer Plate Detail	12/3/2012	SR-19.1	-	-	-

<b>Title of Drawing</b>	<b>Date of Drawing</b>	<b>City of London Drawing Classification</b>	<b>Ontario Provincial Standard Drawings</b>	<b>Date Drawing Superseded or Deleted</b>	<b>Old Drawing Title (if applicable)</b>
Typical 4"x4" Pressure Treated Wood Post and 2 3/8" Round Galvanized Steel Post Installation Detail	12/3/2012	SR-19.2	-	-	-
Typical Square Post and Anchor Post Installations Detail	12/3/2012	SR-19.3	-	-	-
Sign Sheeting and Post Requirements	12/3/2012	SR-19.4	-	-	-
Types of Pavement Markings	2/25/2015	SR-20.0A	-	8/22/2012	Types of Pavement Markings
Types of Pavement Markings	9/21/2015	SR-20.0B	-	-	-
Signalized Intersection Markings	9/25/2015	SR-20.1	-	9/6/2011	Signalized Intersection Markings
Zebra Pavement Marking Detail	9/21/2015	SR-20.2	-	2013	Zebra Pavement Marking Detail
Arrow and Pavement Marking for Bicycle Lanes	9/22/2015	SR-20.3	-	9/9/2011	Arrow and Pavement Marking for Bicycle Lanes
Bicycle Sharrow Pavement Markings	9/9/2011	SR-20.4	-	-	-









**NOTES:**

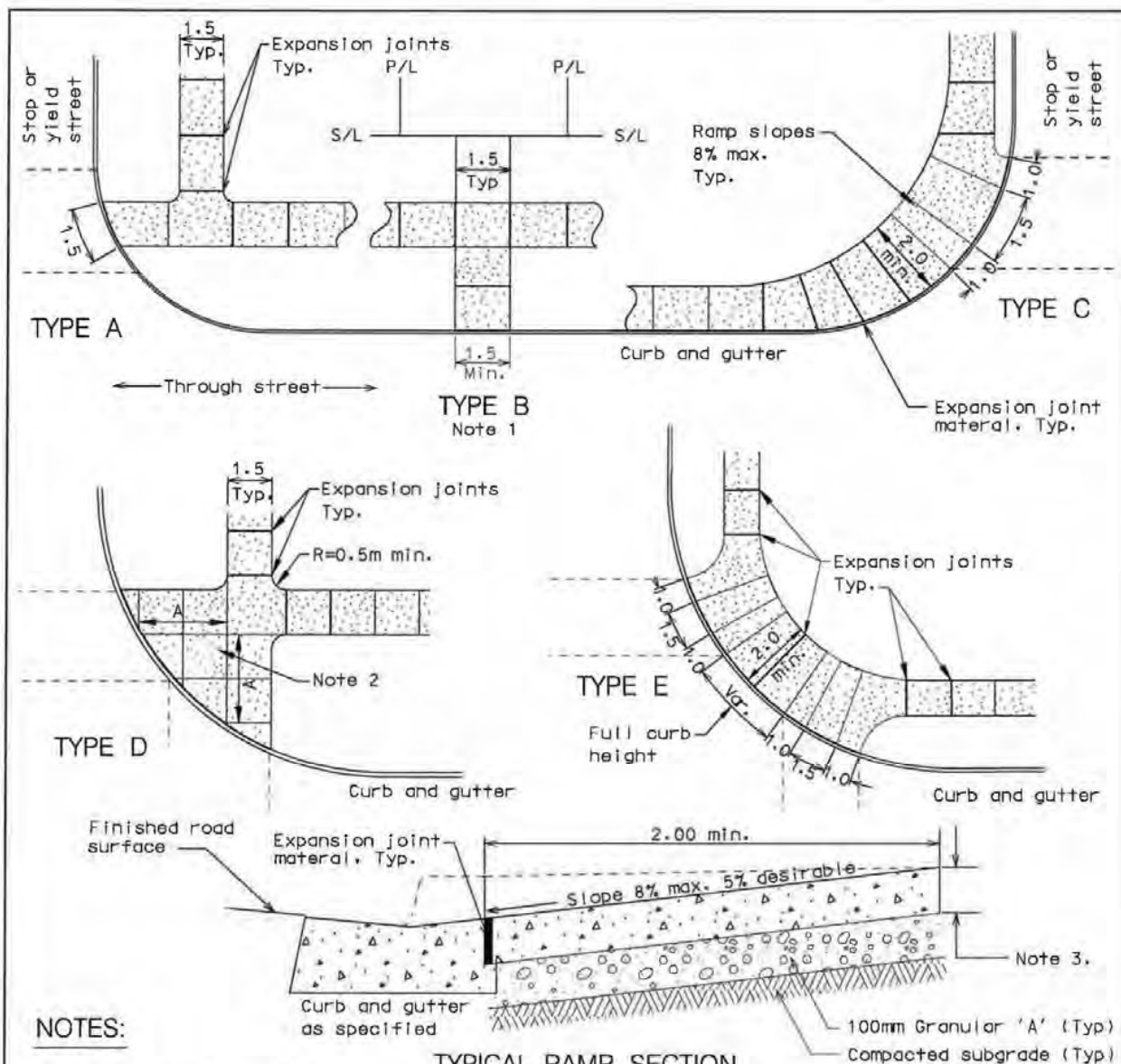
1. Sidewalk thickness at residential driveways and adjacent to curb shall be 100 mm. At commercial and industrial driveways the thickness shall be 150mm unreinforced unless otherwise specified.

- A. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN
2. Sidewalk width may be increased to: 2.4m at schools, bus stops and other high pedestrian areas.
3. For NEW subdivisions, maximum boulevard grade shall be 4%.
4. Refer to drawing SR-1.2 for concrete sidewalk ramp detail.

CITY OF LONDON STANDARD DRAWING

CONCRETE SIDEWALK  
ABUTTING CURB AND GUTTER

DWG NO SR-1.1	DATE 2017 12 11	APPROVED BY CITY ENGINEER <i>Scheu</i>
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CITY OF LONDON STANDARD DRAWING

## CONCRETE SIDEWALK RAMPS

DWG

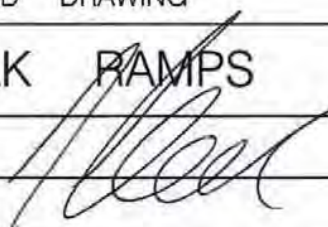
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DATE

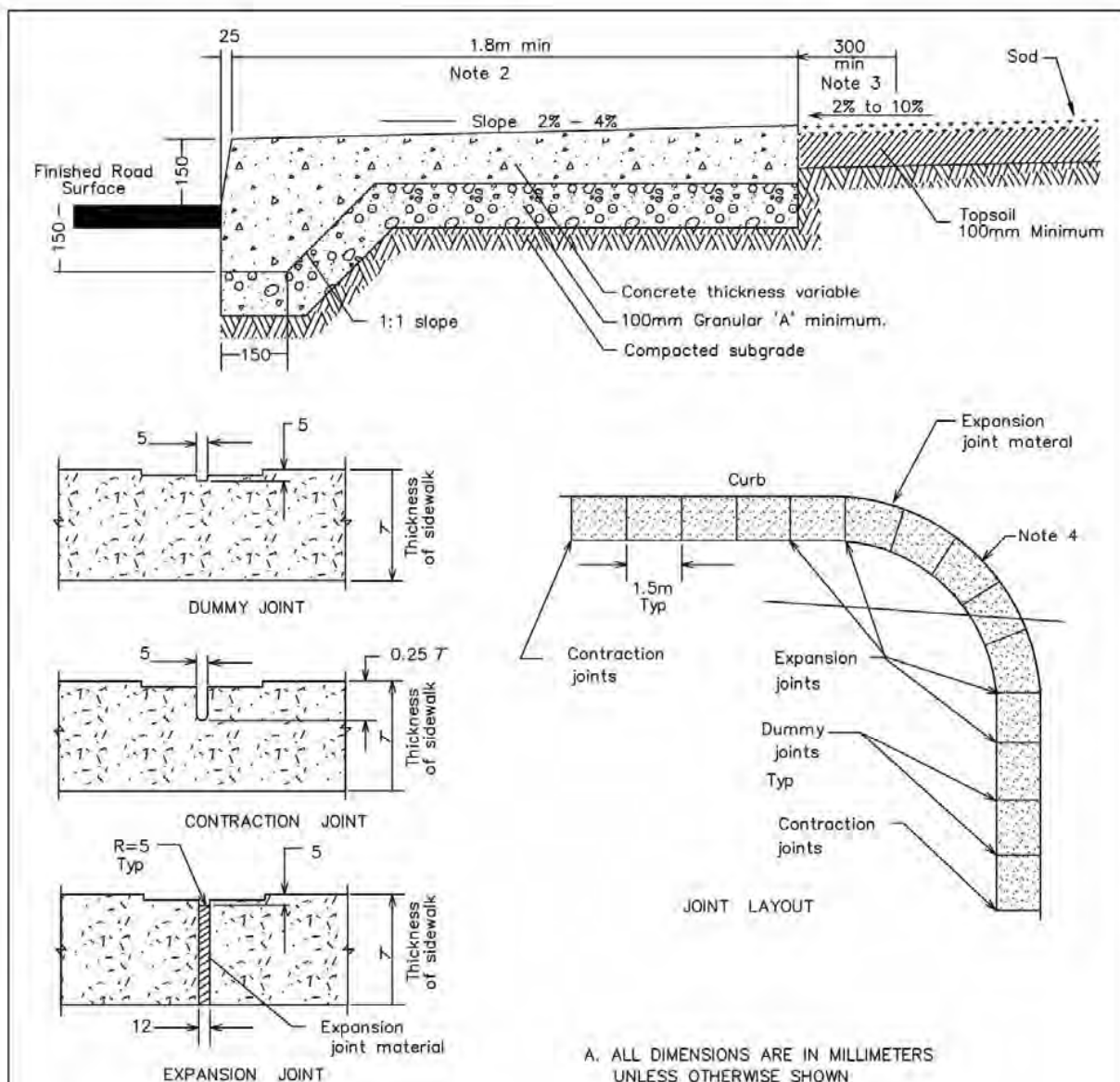
2011 08 26

APPROVED BY

CITY ENGINEER







NOTES:

1. Sidewalk thickness at residential driveways and adjacent to curb, shall be 100mm. At commercial and industrial driveways the thickness shall be 150mm unreinforced unless otherwise specified.

- A. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. Sidewalk width may be increased to: 2.4m at schools, bus stops and other high pedestrian areas.
3. For NEW subdivisions, maximum boulevard grade shall be 4%.
4. Refer to drawing SR-1.2 for sidewalk ramp details.

CITY OF LONDON STANDARD DRAWING

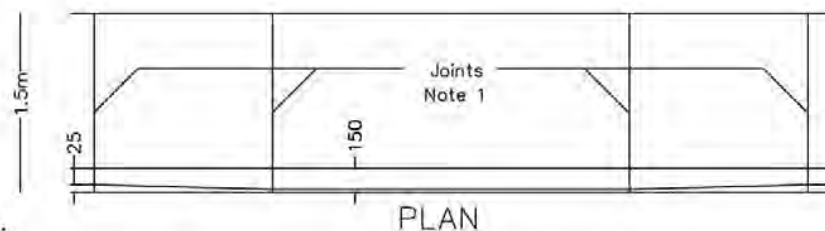
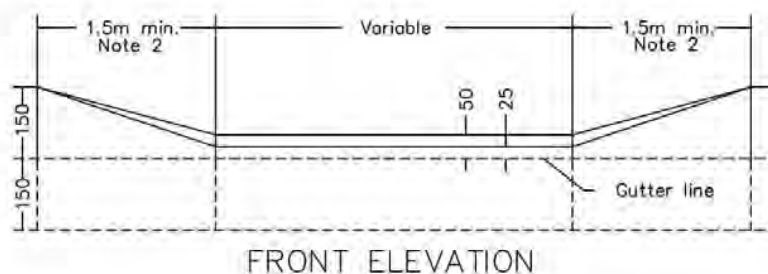
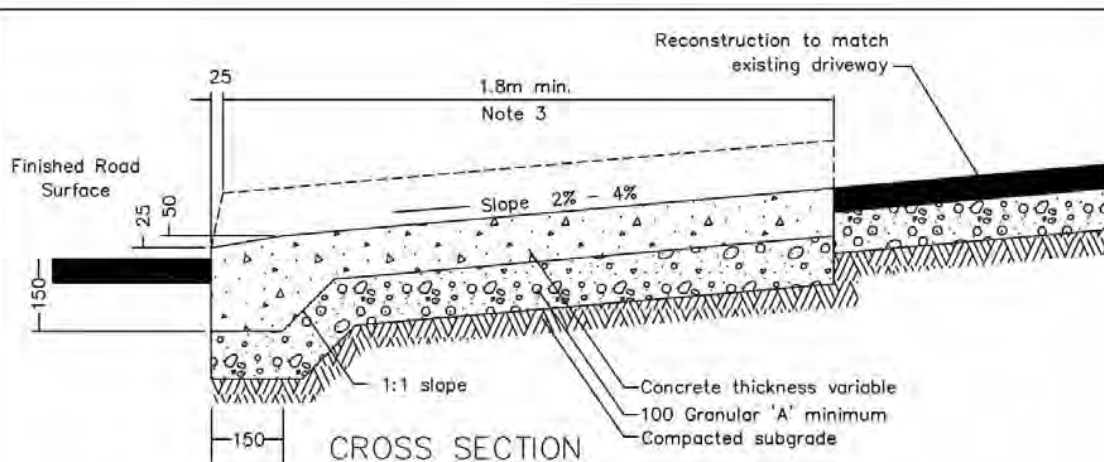
COMBINATION CURB-FACE SIDEWALK

DWG SR-1.3

DATE 2017 12 11

APPROVED BY  
CITY ENGINEER

*Scheu*



NOTES:

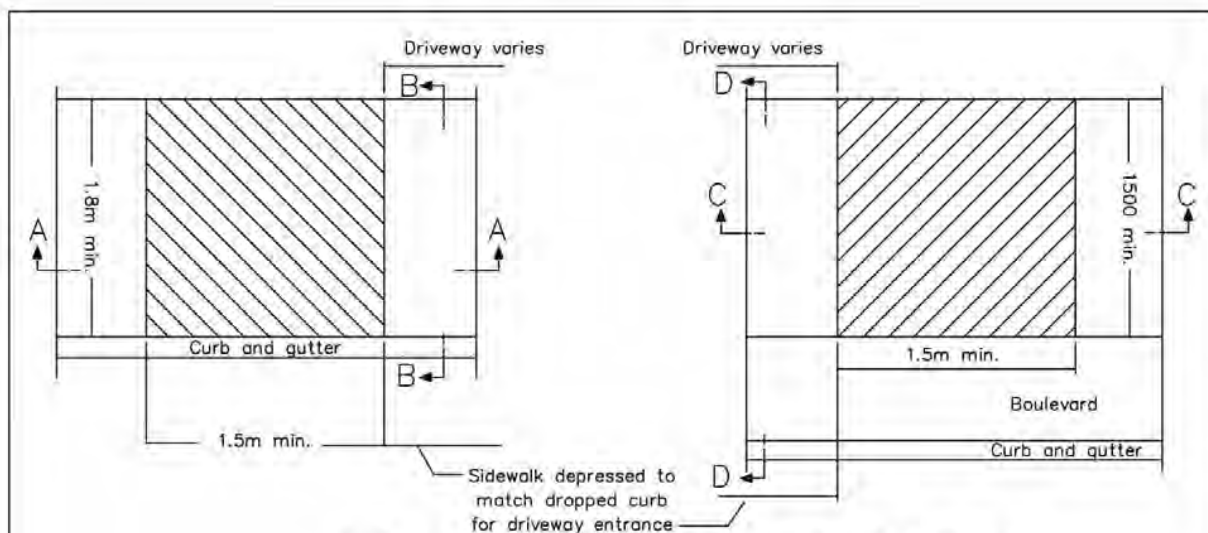
1. To be used in conjunction with detail on drawing SR-1.0
2. Length as required for a max. grade of 4% over 1.5 min.
3. Sidewalk width may be increased to: 2.4m at schools, bus stops and other high pedestrian areas.

A. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

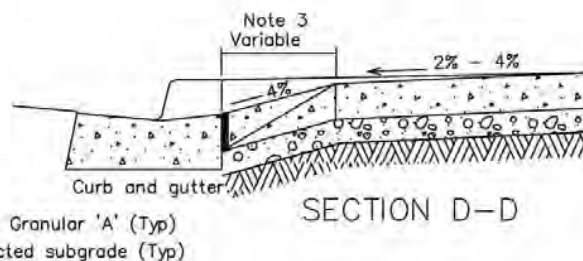
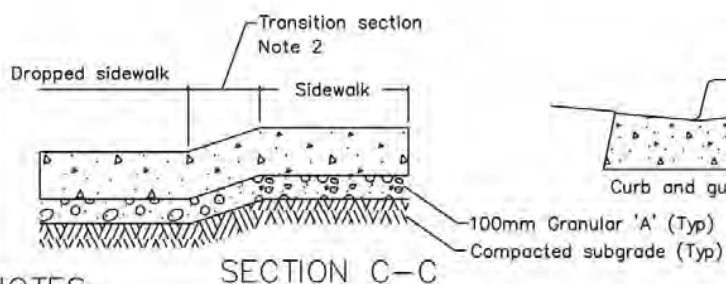
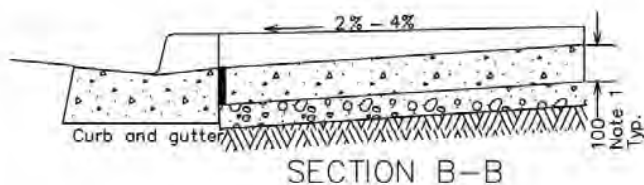
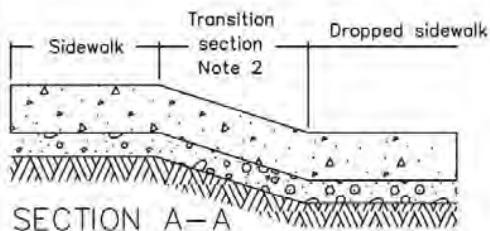
4. Max. sidewalk gradient 4% or as directed by Contract Administrator

CITY OF LONDON STANDARD DRAWING  
COMBINATION CURB-FACE SIDEWALK  
AT DRIVEWAY ENTRANCES

DWG SR-1.4	DATE 2017 12 11	APPROVED BY CITY ENGINEER <i>Schew</i>
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SIDEWALK AT DRIVEWAY ENTRANCE-PLAN



NOTES:

1. At commercial and industrial driveways the sidewalk thickness shall be 150mm unreinforced unless otherwise specified.
2. Length as required for a maximum grade of 4%.

A. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

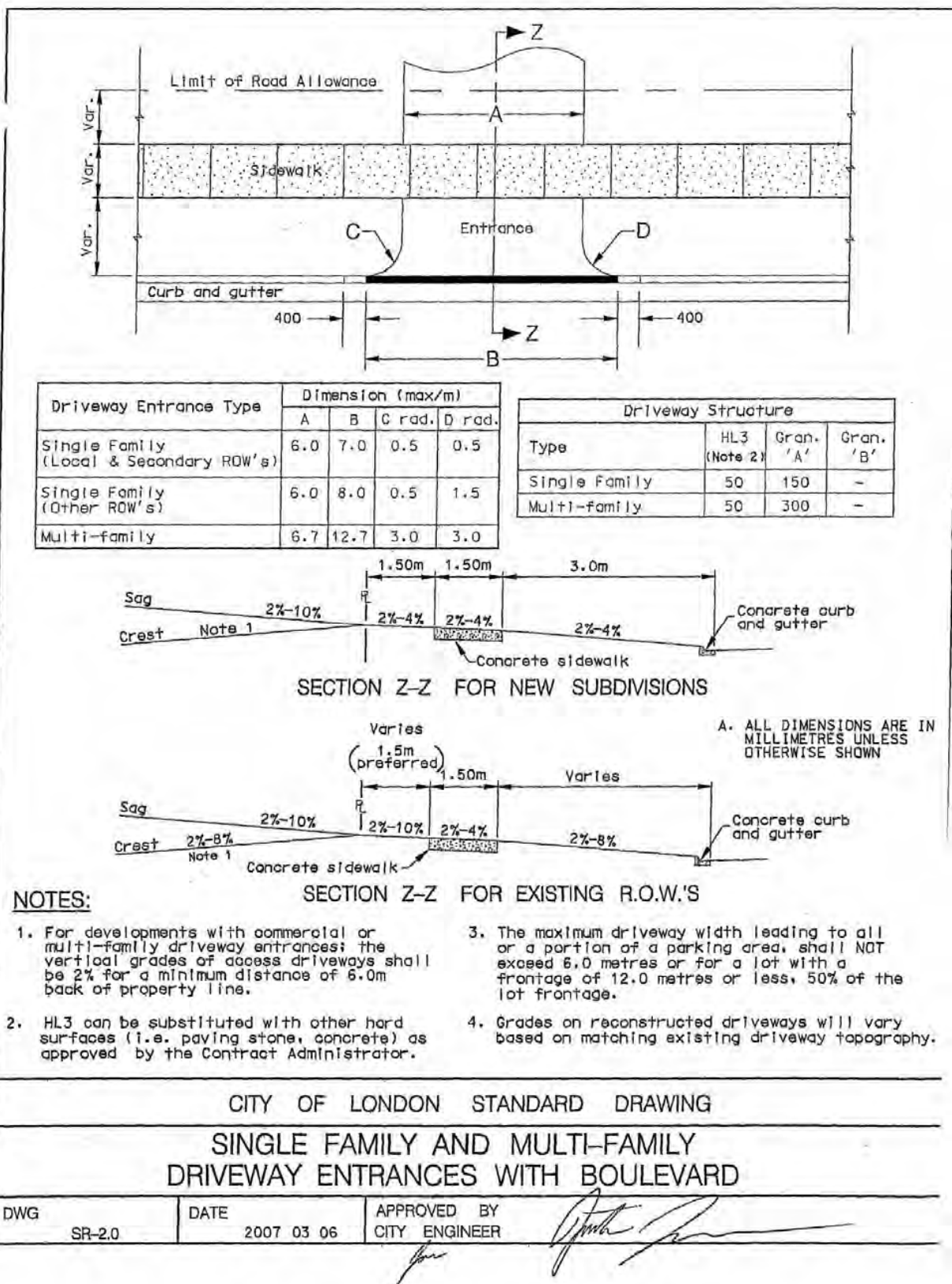
3. For NEW subdivisions, maximum upgrade shall be 4%.

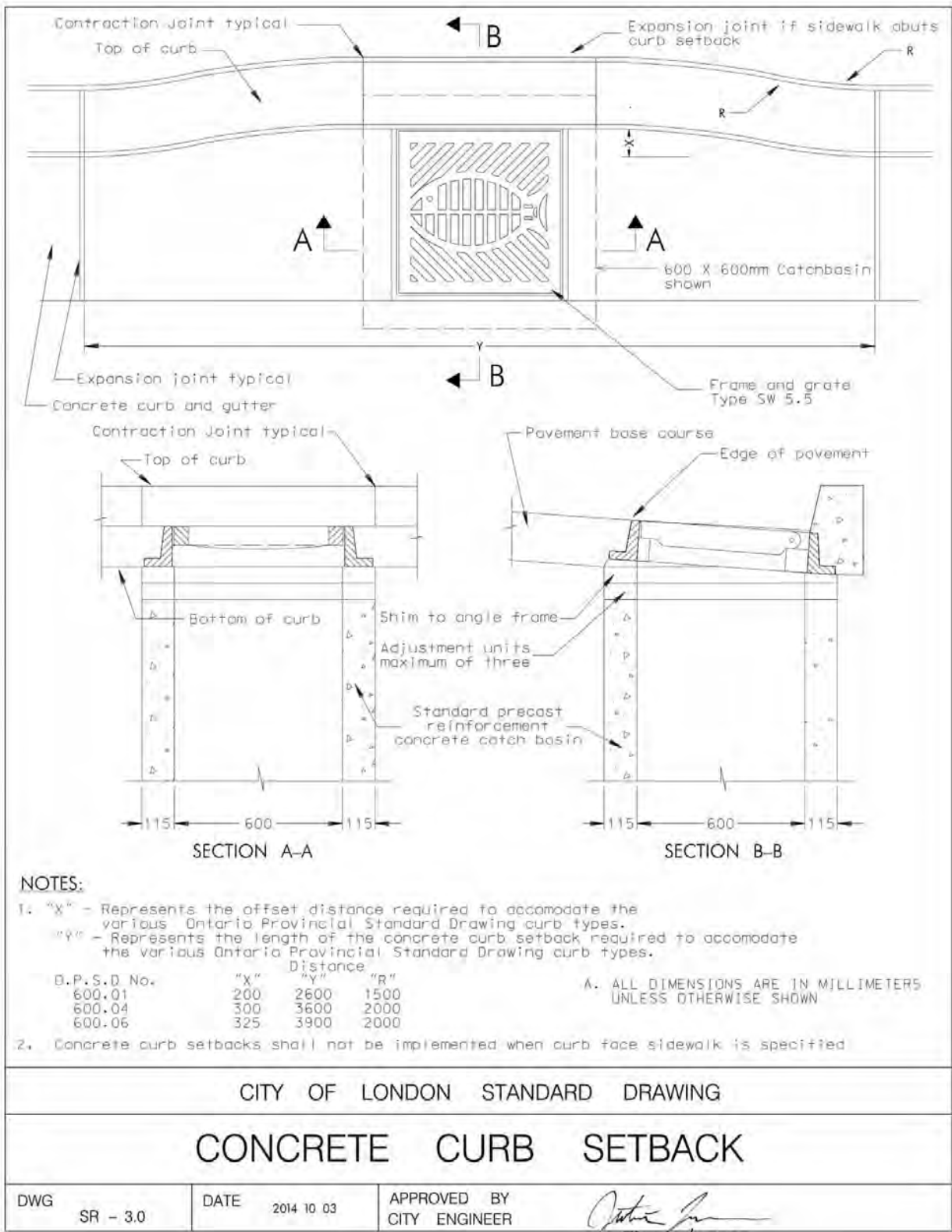
CITY OF LONDON STANDARD DRAWING

SIDEWALK DRIVEWAY ENTRANCE DETAILS

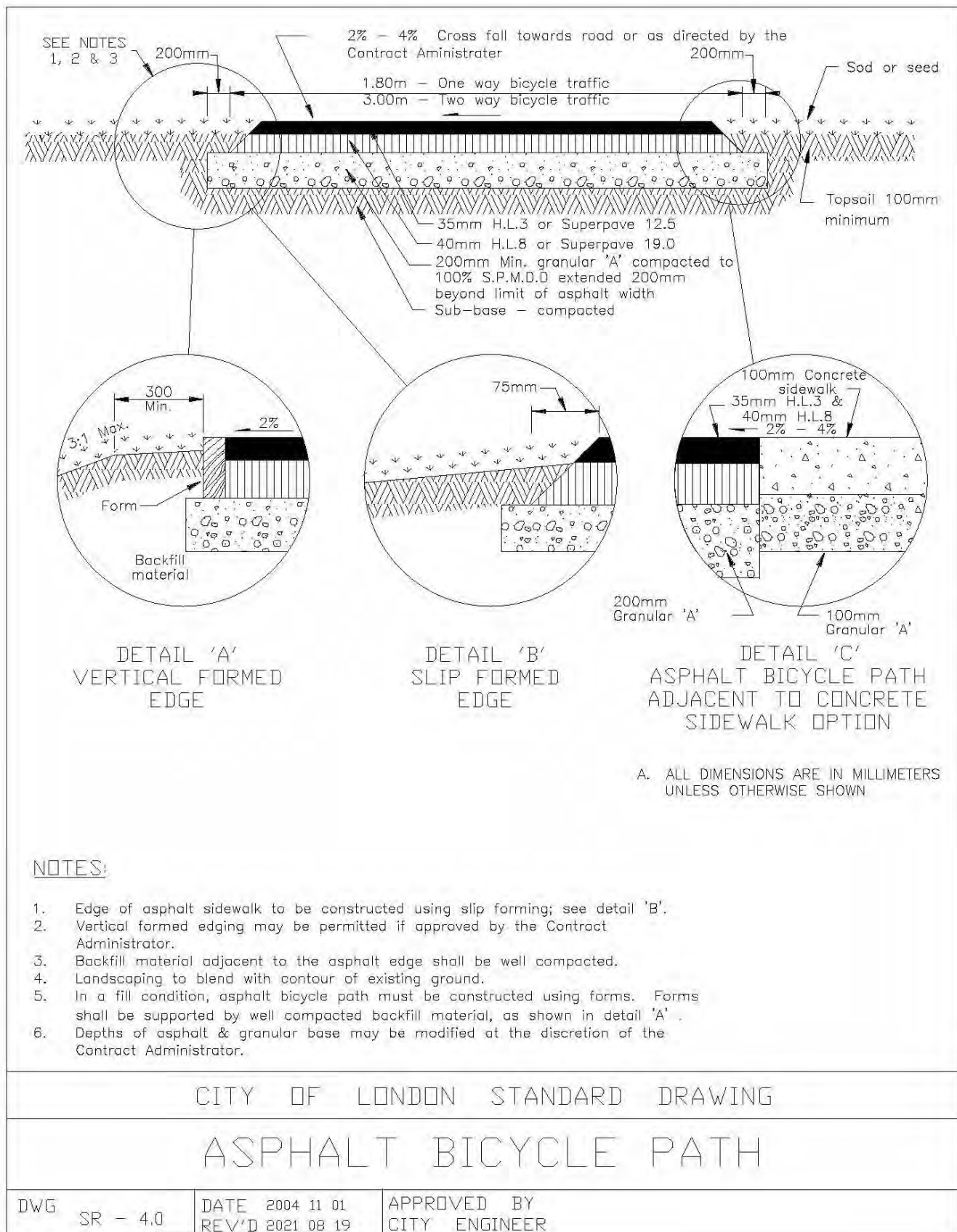
DWG	DATE	APPROVED BY
SR-1.5	2017 12 05	CITY ENGINEER <i>Scheu</i>

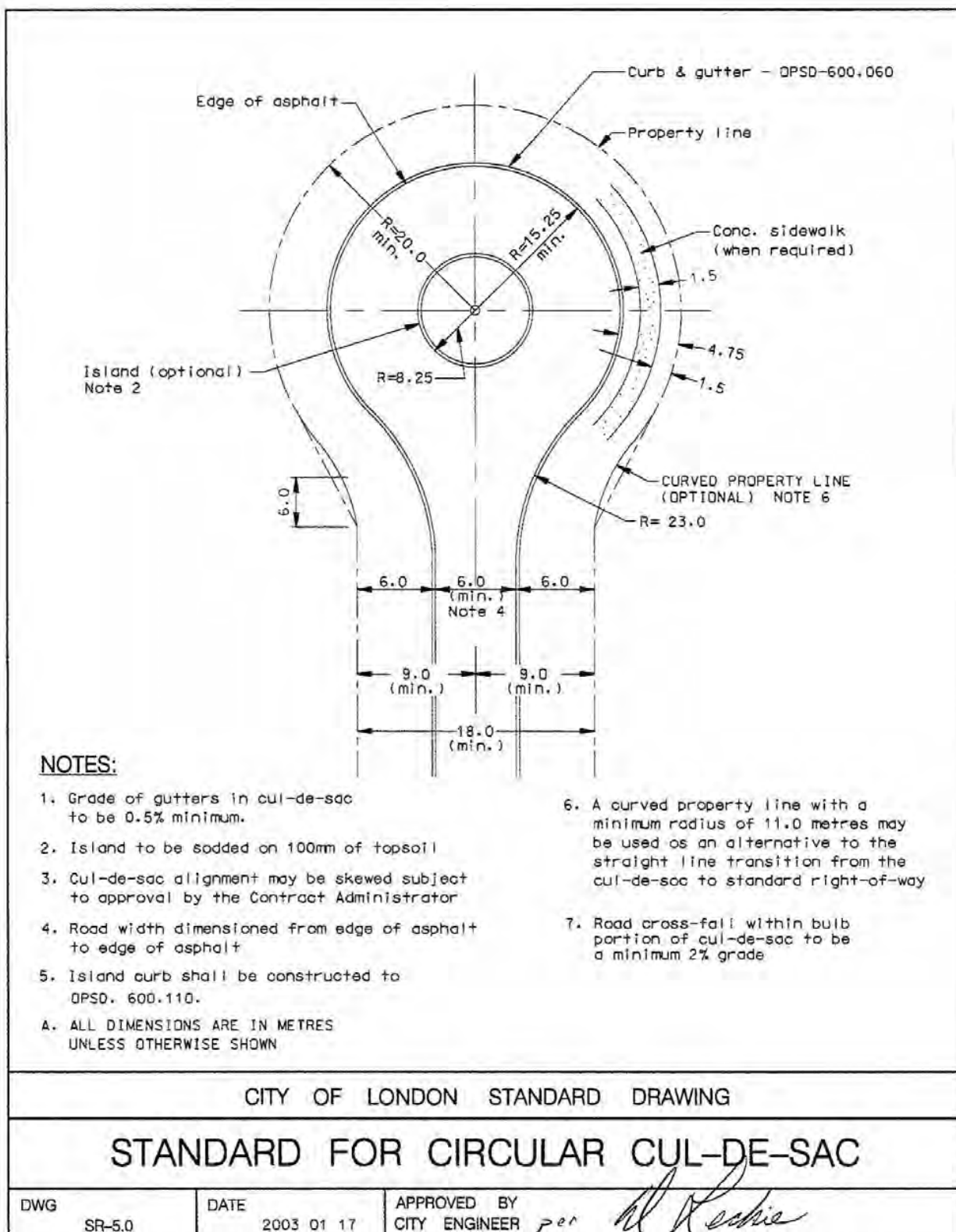


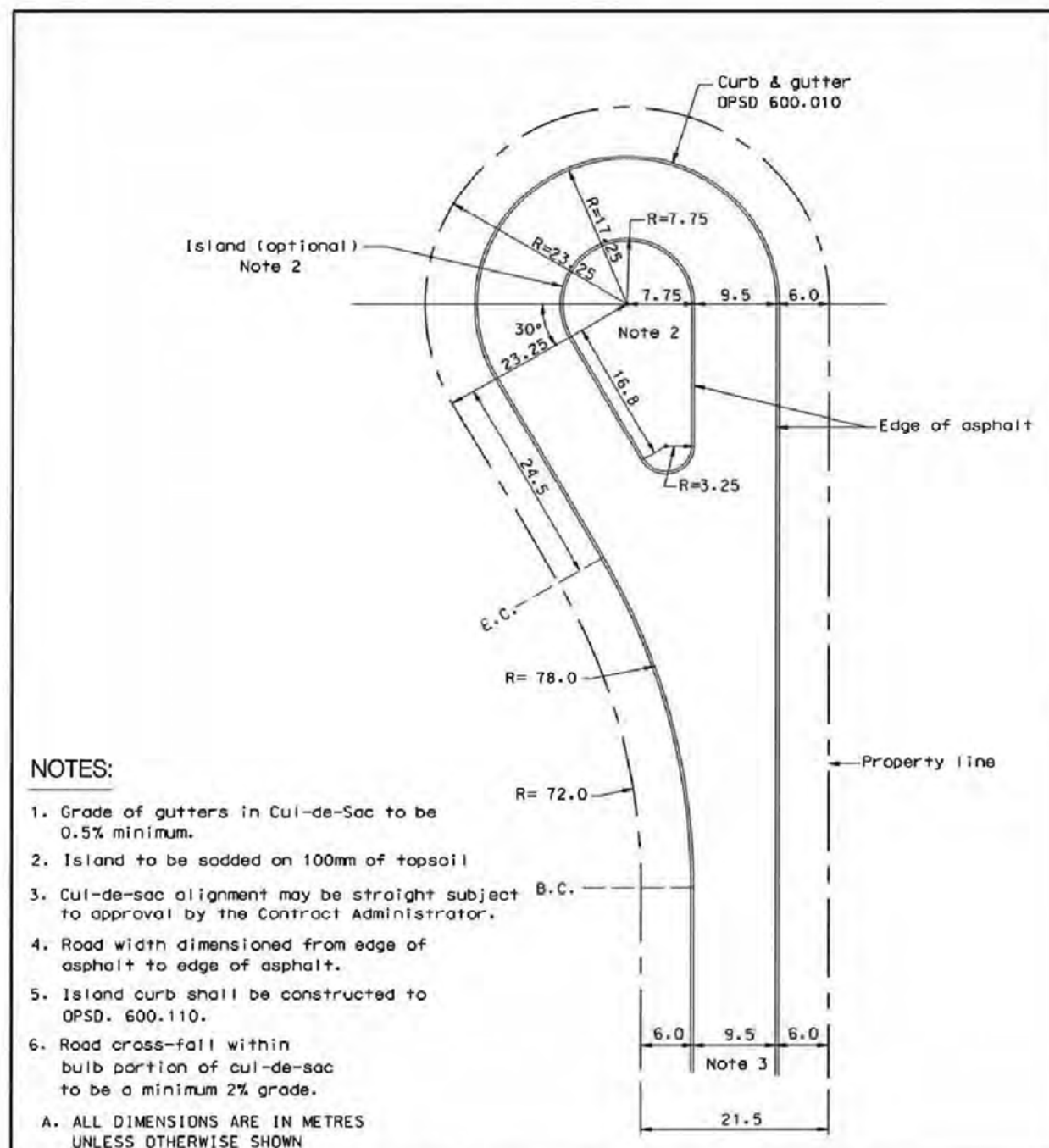










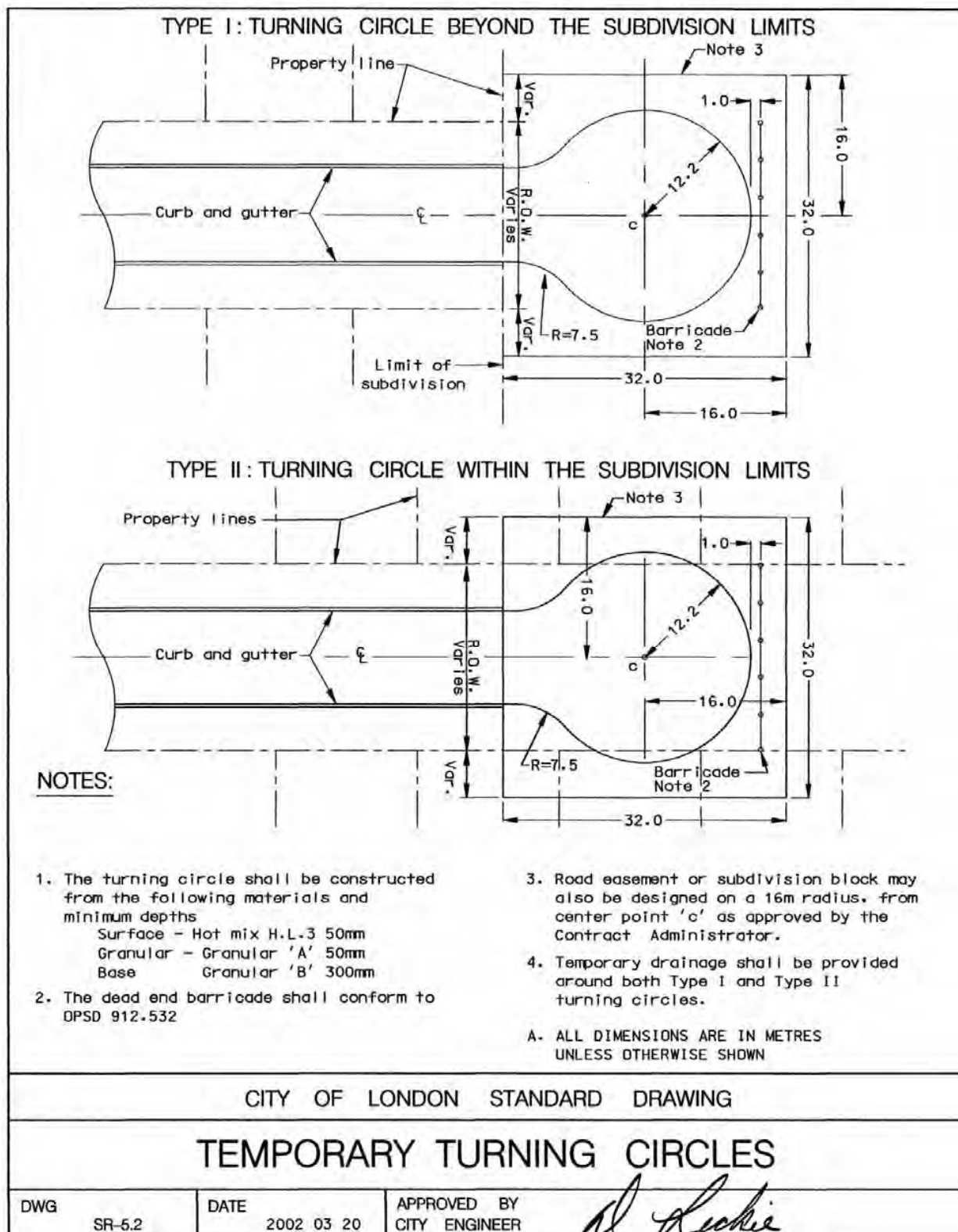


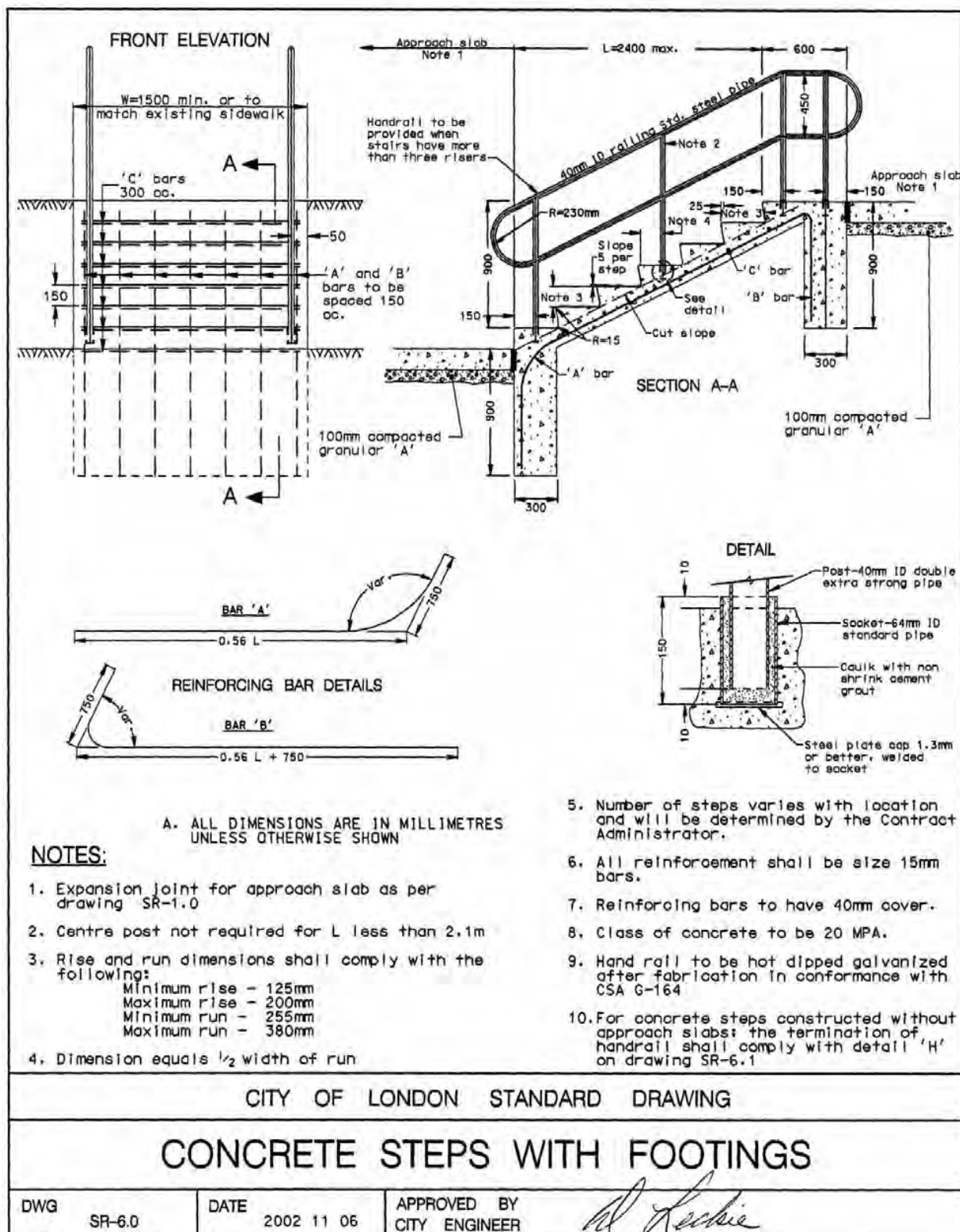
CITY OF LONDON STANDARD DRAWING

# STANDARD FOR INDUSTRIAL CUL-DE-SAC

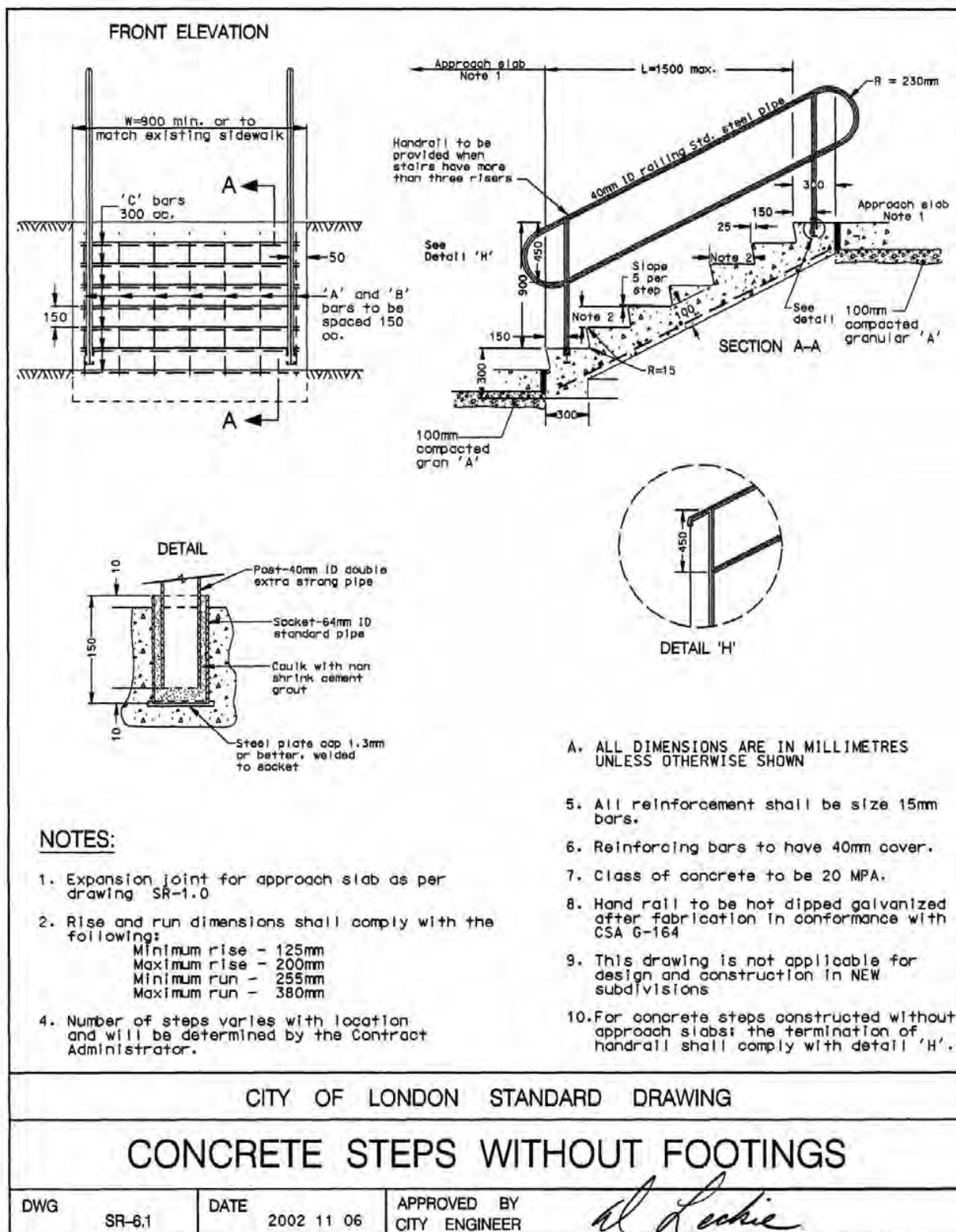
DWG SR-5.1	DATE 2010 09 22	APPROVED BY <i>[Signature]</i> CITY ENGINEER
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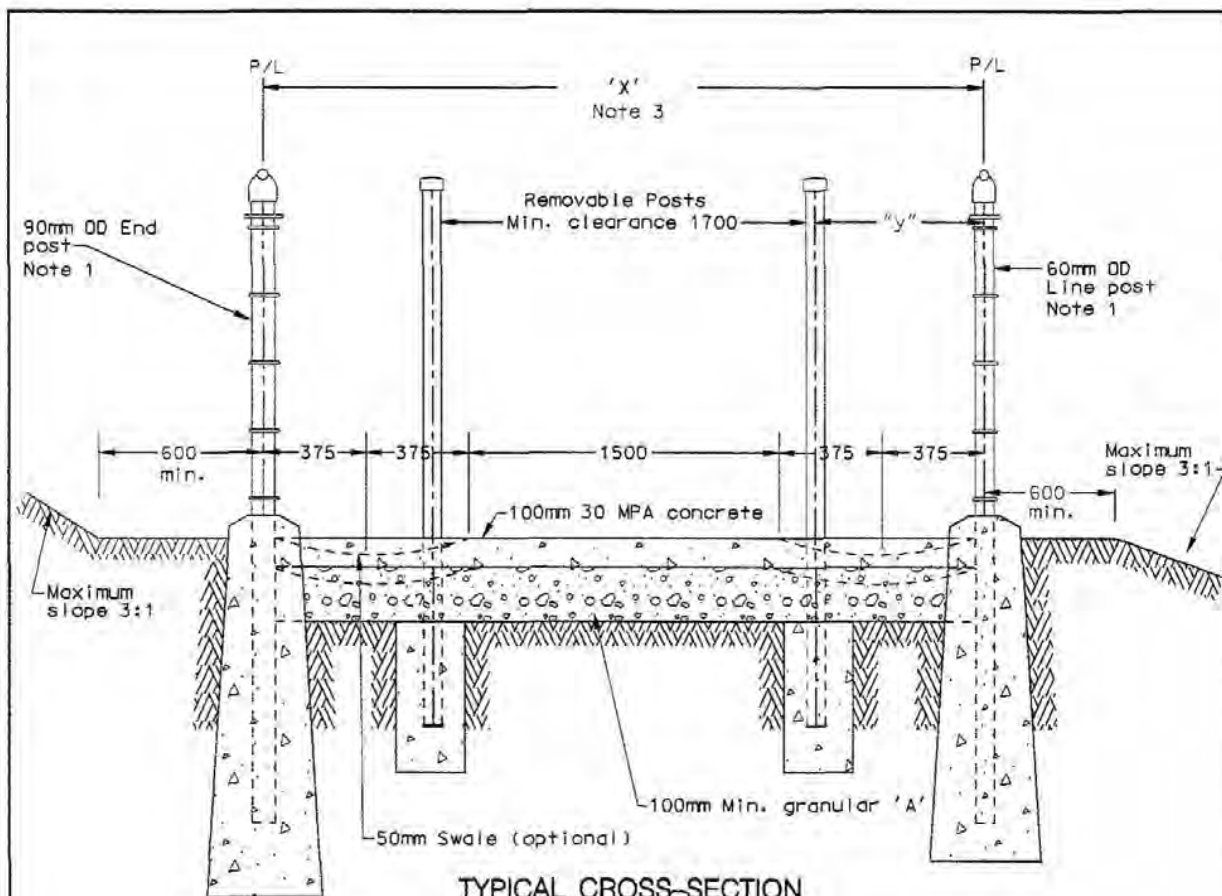












TYPICAL CROSS-SECTION

NOTES:

1. Chain link fence detail shall comply with the requirements of DPSS-541 and DPSS 972.130 except for the following amendments. The height of the fence shall read 1.2m and the footing detail, part 'a' in earth is amended to read 'a' in concrete'. In lieu of a chain link fence, an approved wooden fence in accordance with Fencing By-Laws PS-1 & PS-1A and Swimming Pool (as applicable) By Law PS-2 can be constructed adjacent to the walkway/ access entirely on private property. The wooden fence is to terminate 6.0m from the street line and continue with a 1.2m wooden fence or a 1.2m chain link fence to the street line. All wooden fence details are to be reviewed and/or approved by Environmental Services Department.

A. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN

2. In NEW subdivisions, where walkway grades exceed 10%, stairs are to be constructed in accordance with drawing SR-6.0. Walkways constructed with grades between 8% and 10% require pedestrian handrails on one side of the walkway in line with the "Removable posts" with the approval of the Contract Administrator. The pedestrian handrail shall conform to DPSS 980.101
3. 'x' varies for 3m and 4.6m cross-sections  
'y' = 620 for 3m cross-sections  
'y' = 1420 for 4.6m cross-sections
4. A crossfall of 2% or alternative swales.
5. Removable posts to be installed in locations indicated on approved drawings. Refer to drawing SR-8 for removable post and footing detail.
6. Walkway Lighting to be in accordance with current City of London regulations.

CITY OF LONDON STANDARD DRAWING

STANDARD PEDESTRIAN WALKWAY

DWG

SR-7.0

DATE

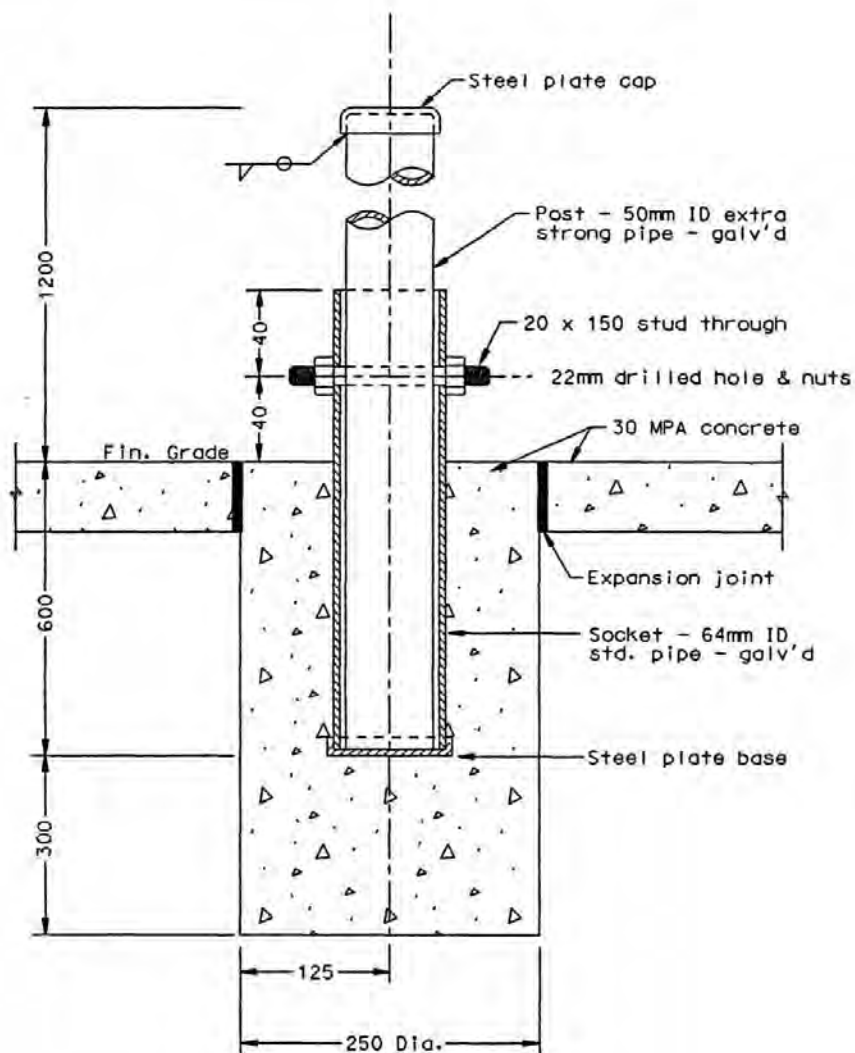
2003 01 17

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CITY ENGINEER

per

*A. Leckie*





DETAIL

**NOTES:**

- A. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN
1. Removable post shall be of galvanized steel pipe and shall conform to CAN2-138.2-M

CITY OF LONDON STANDARD DRAWING

**REMOVABLE POST DETAIL**

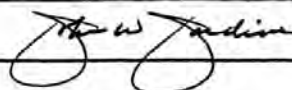
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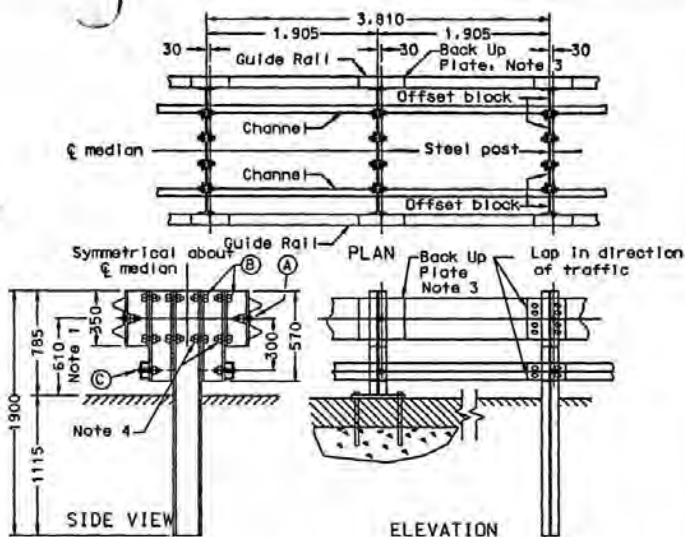
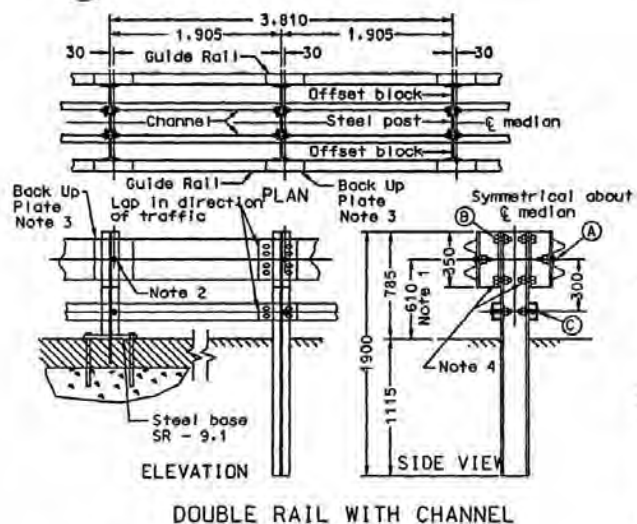
SR-8.0

DATE

1996 03 15

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CITY ENGINEER





NOTES:

- 1 Where guide rail is adjacent to curb, mounting height shall be measured:
  - a Vertically at face of guide rail when face of guide rail is more than 300mm beyond gutter line.
  - b Vertically at gutter line when face of guide rail is 300mm or less beyond gutter line.
- 2 Washer not required at face of rail.
- 3 Back up plate shall be installed at intermediate posts, only.
- 4 2 bolts at each connection located at opposing upper and lower holes.

Abbreviations:

\*BH-Button head bolt  
\*HB-Hex bolt  
\*CB-Carriage bolt

A To produce an even alignment, shim beam element where necessary.

B This standard to be read in conjunction with OPSD-902.01, 902.02, and SR - 9.1.

C All dimensions are in millimetres or metres unless otherwise shown.

POST BOLT AND HOLE		
Hole Dia mm	Post bolt and nut mm	Washer
(A) 20	16x50 *BH	Plate
(B) 20	16x38 *HB	Plate
(C) 20	16x100 *CB	Plate

CITY OF LONDON STANDARD DRAWING

STEEL BEAM GUIDE RAIL - STEEL POST ASSEMBLY DETAIL

DOUBLE RAIL WITH CHANNEL AND DOUBLE OFFSET RAIL WITH CHANNEL

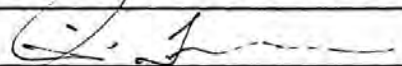
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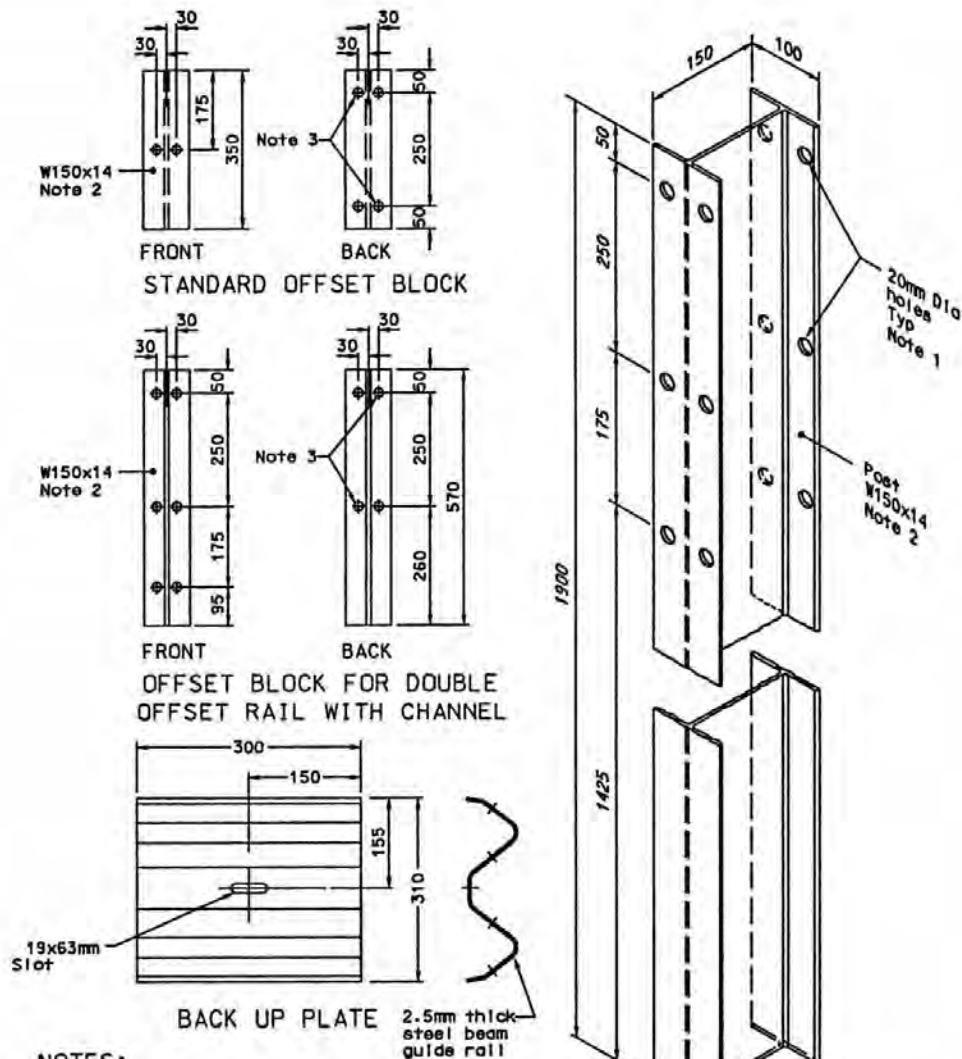
SR-9.0

DATE

1998 03 01

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CITY ENGINEER





NOTES:

- 1 Holes on back of post are required for median guide rail installations, only.
  - 2 Imperial size steel sections W6x9 and W6x8.5 are acceptable.
  - 3 2 bolts located at opposing upper and lower holes shall be used for offset block connection.
- A All dimensions are in millimetres or metres unless otherwise shown.

POST DETAIL

CITY OF LONDON STANDARD DRAWING

STEEL BEAM GUIDE RAIL - STEEL POST  
POST AND OFFSET BLOCK DETAILS  
SHOULDER OR MEDIAN INSTALLATIONS

DWG

SR-9.1

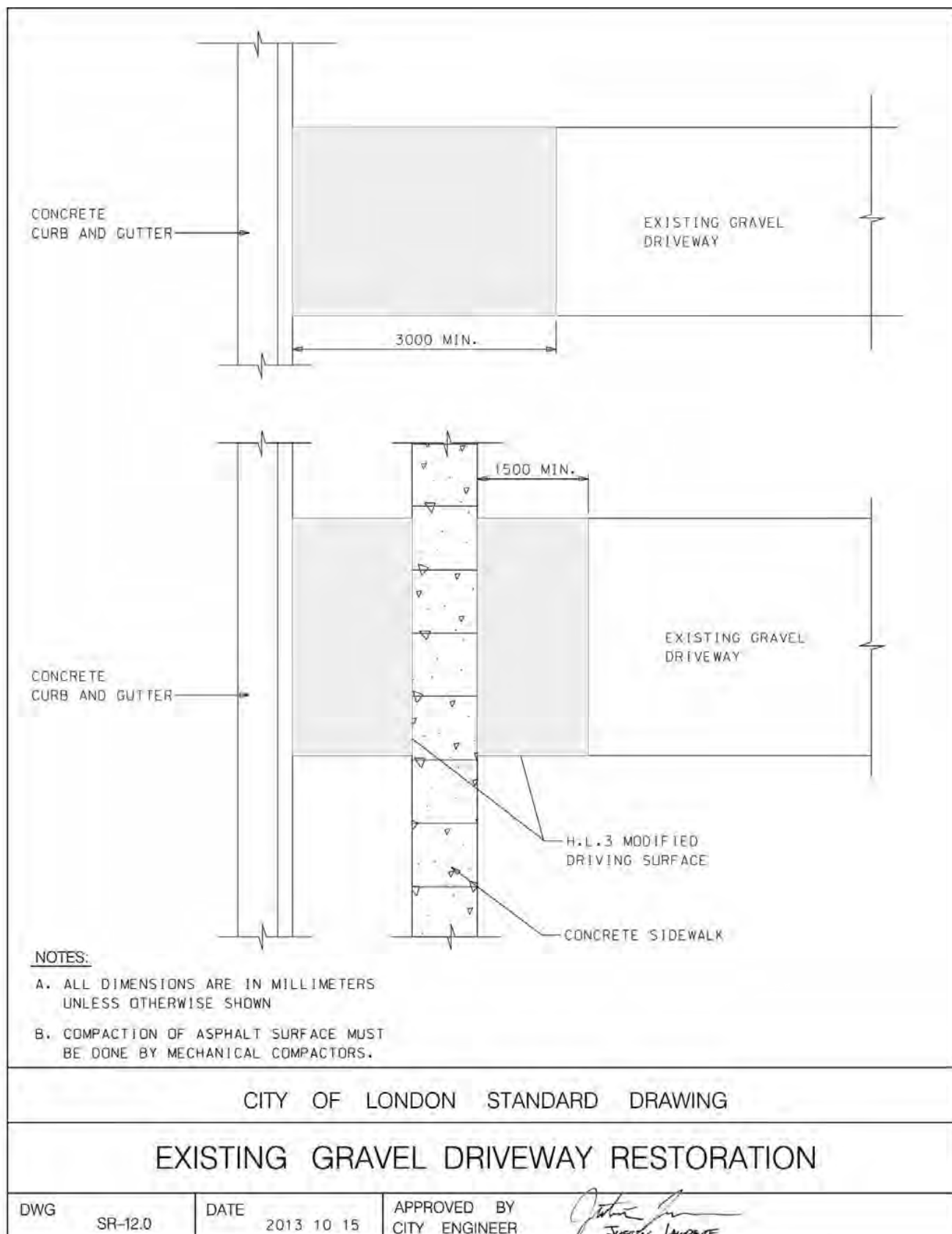
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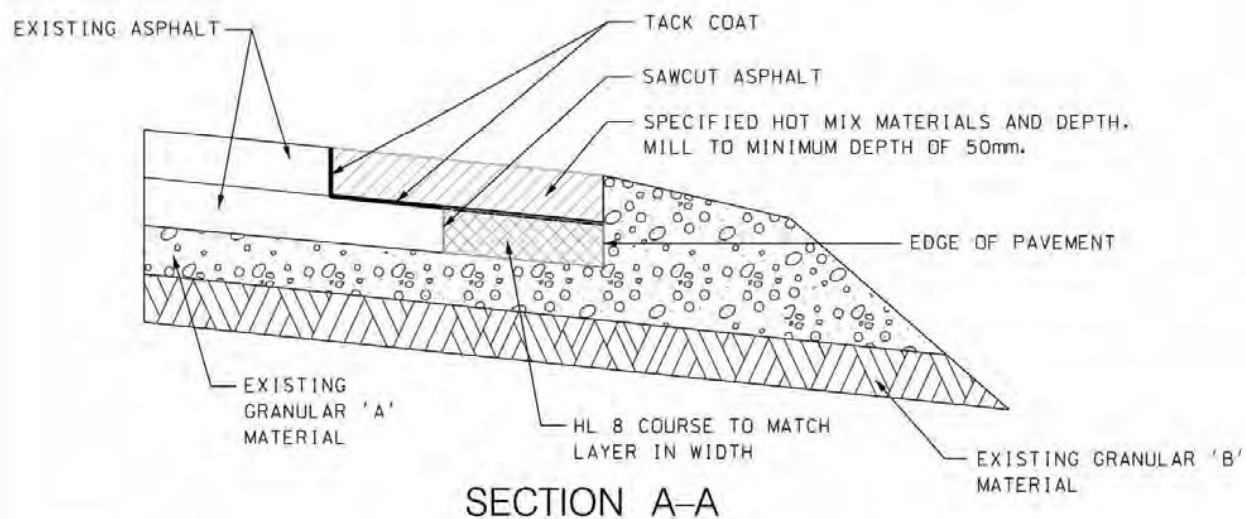
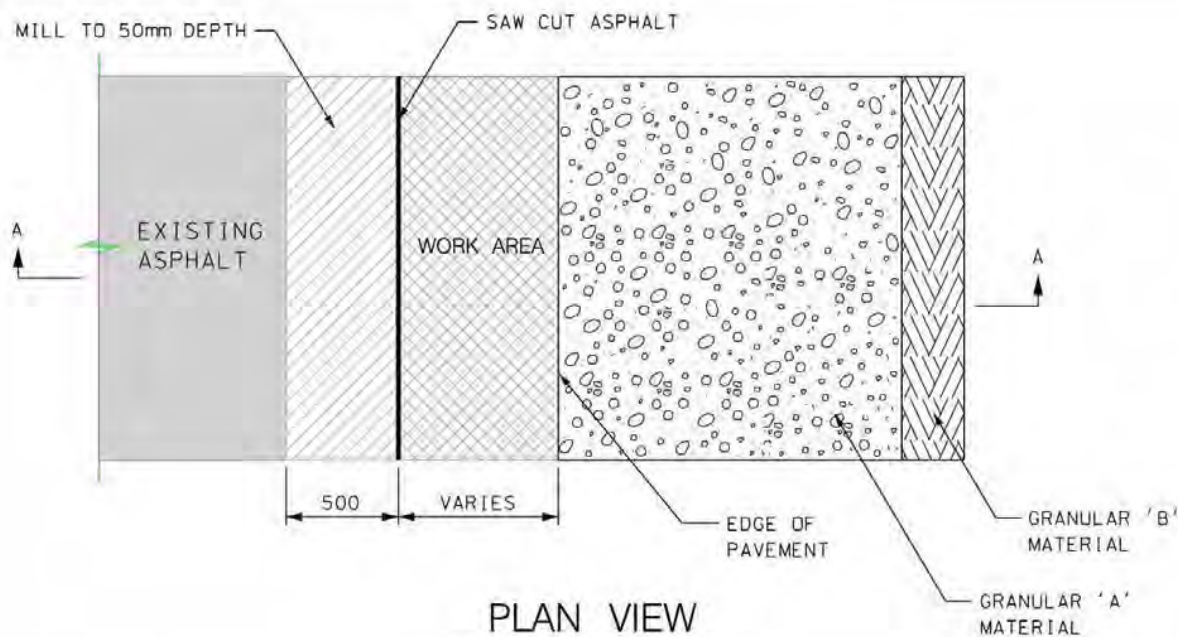
1998 03 01

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CITY ENGINEER









NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN
2. MIN. DEPTH OF EXISTING ASPHALT MUST BE 90mm.
3. STEPPED JOINT MUST BE PROVIDED AROUND THE ENTIRE PERIMETER OF THE WORK AREA WHERE THE WORK ZONE IS EXPANDING TO THE MIDDLE OF THE ROAD.
4. SAME DETAIL APPLIES FOR THE URBAN CROSS-SECTION.

CITY OF LONDON STANDARD DRAWING

STEPPED MILLED JOINT PAVEMENT DETAIL

DWG

SR-13.1

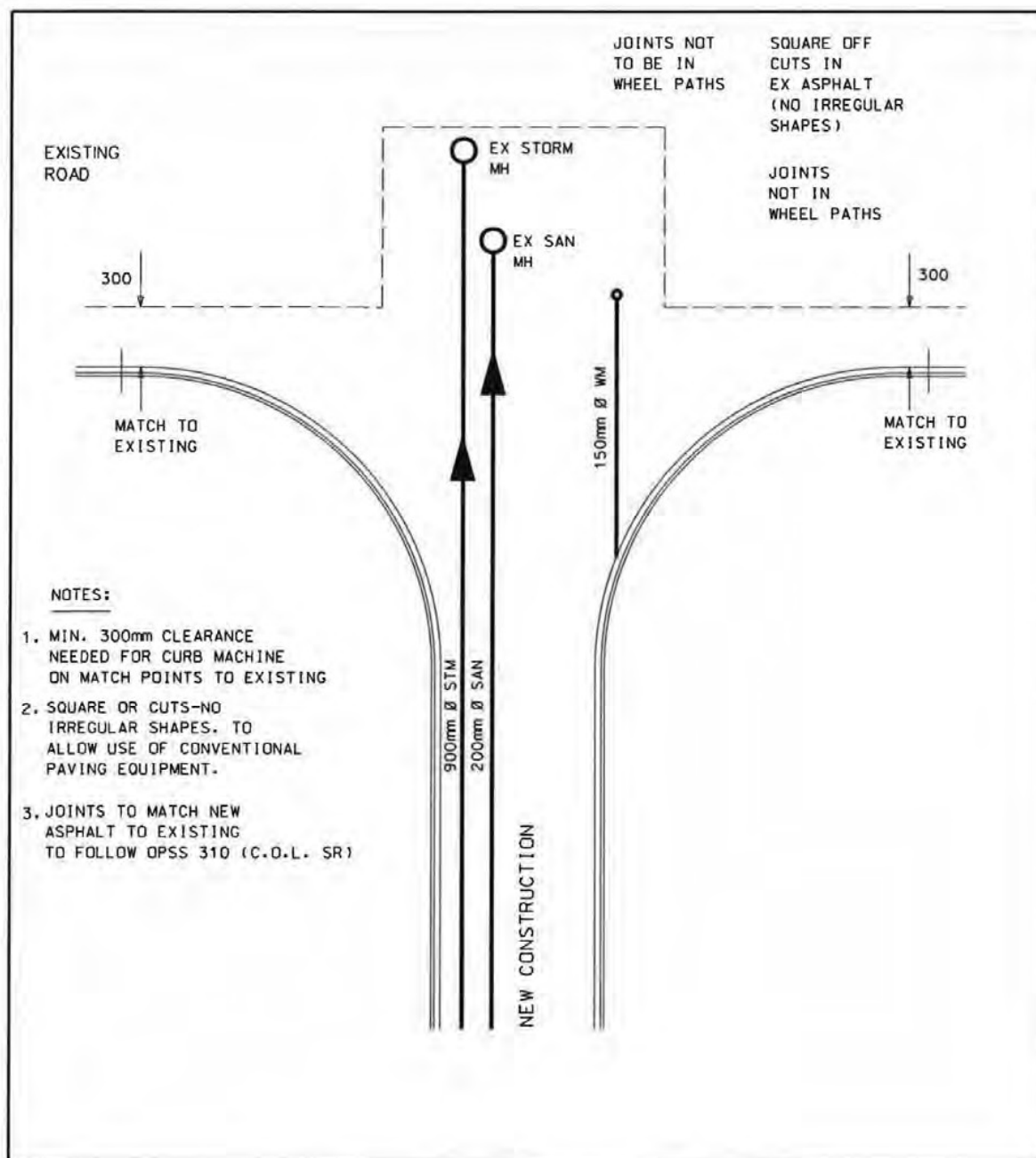
DATE

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CITY ENGINEER

*Justin Lawrence*  
JUSTIN LAWRENCE





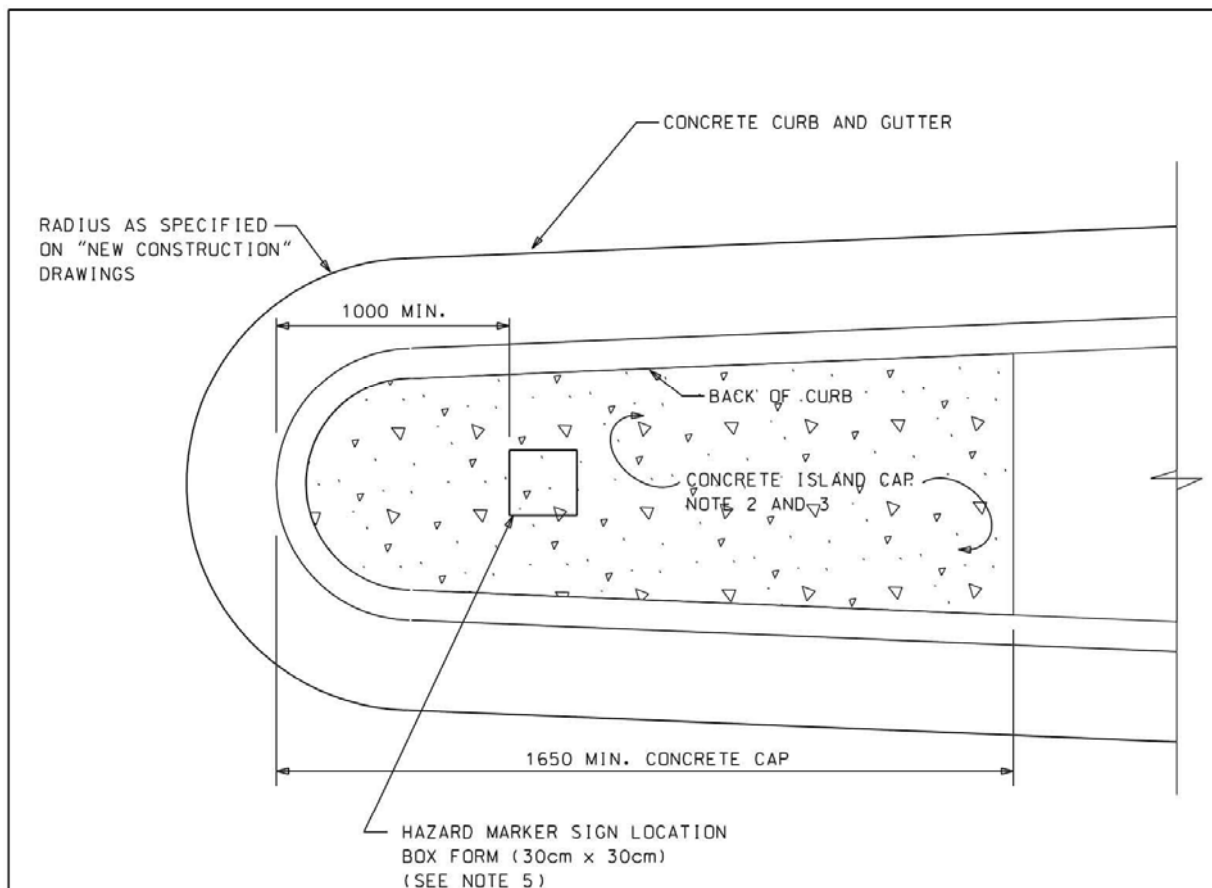
CITY OF LONDON STANDARD DRAWING

PAVEMENT CUT GUIDELINES  
MATCHING NEW CONSTRUCTION TO EXISTING ASPHALT

DWG	SR-14	DATE	2010 09 22	APPROVED BY	CITY ENGINEER
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NOTES:

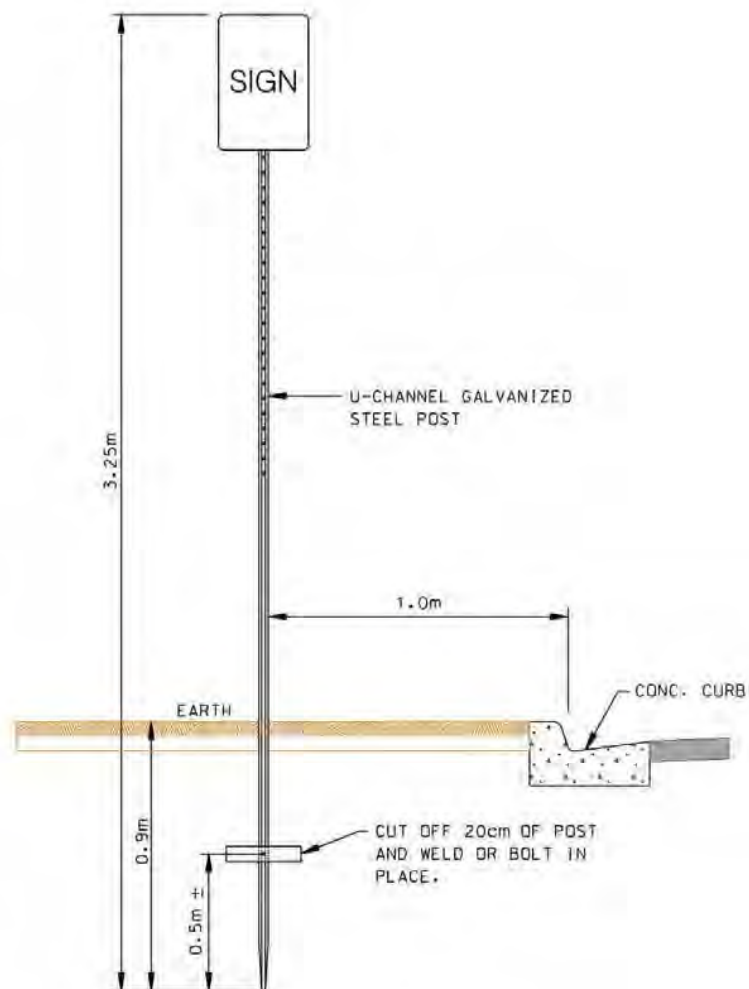
1. THIS DRAWING TO BE READ TOGETHER WITH THE APPLICABLE ONTARIO PROVINCIAL STANDARD DRAWING (OPSD) 606.02 THROUGH 607.02 INCLUSIVE.
2. CONCRETE ISLAND CAP TO COMPLY WITH THE REQUIREMENTS OF ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) 351.
3. THICKNESS OF CONCRETE ISLAND CAP SHALL BE A MINIMUM 100mm.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. BOX FORMS (AVAILABLE FREE OF CHARGE FROM CITY OF LONDON OPERATIONS 519-661-2500 x4923) ARE TO BE PLACED WHERE FUTURE ROAD SIGNS OR HAZARD MARKERS ARE TO BE INSTALLED. WHERE CONTRACTOR IS REQUIRED TO INSTALL HAZARD MARKER SIGNS REFER TO SR 19.3. THE BOX FORM IS TO BE LOCATED APPROXIMATELY 1000mm FROM THE END OF THE ISLAND AND CENTERED IN THE ISLAND AT THIS LOCATION.

CITY OF LONDON STANDARD DRAWING

CONCRETE ISLAND BULLNOSE

DWG	SR-19.0	DATE	2012 12 03	APPROVED BY	CITY ENGINEER
					<i>Justin Lawrence</i>

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U-CHANNEL POST DETAIL

NOTE:

1. ALL HARDWARE MUST BE VANDAL PROOF.
2. BRACKETS MUST BE STAINLESS STEEL.
3. ALL NUTS AND BOLTS ARE BREAKAWAY ALUMINUM.
4. ALL DIMENSIONS ARE APPROXIMATE, REFER TO ONTARIO TRAFFIC MANUAL FOR PROPER INSTALLATION DETAILS.

CITY OF LONDON STANDARD DRAWING

TYPICAL U-CHANNEL POST AND  
STABILIZER PLATE DETAIL

DWG

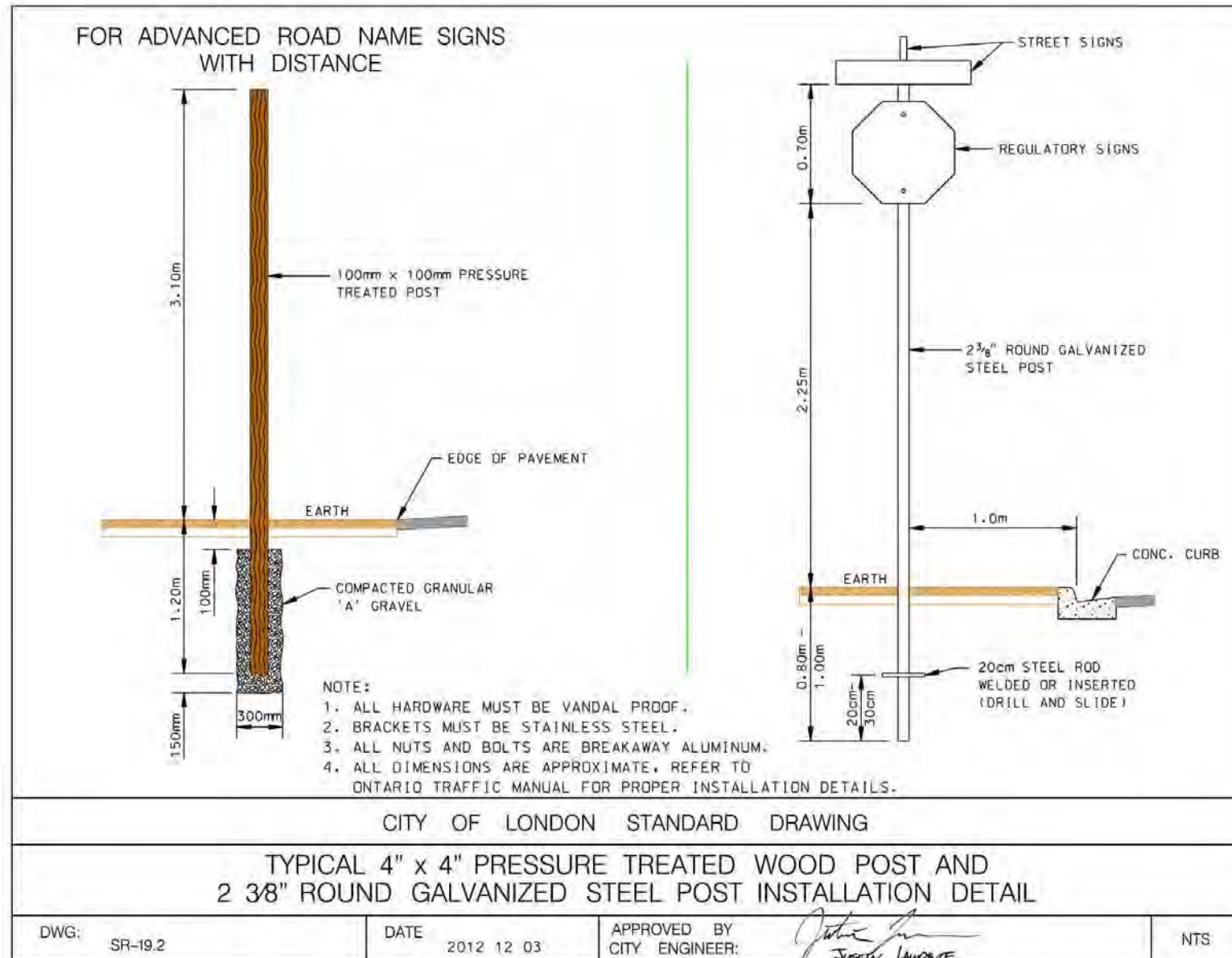
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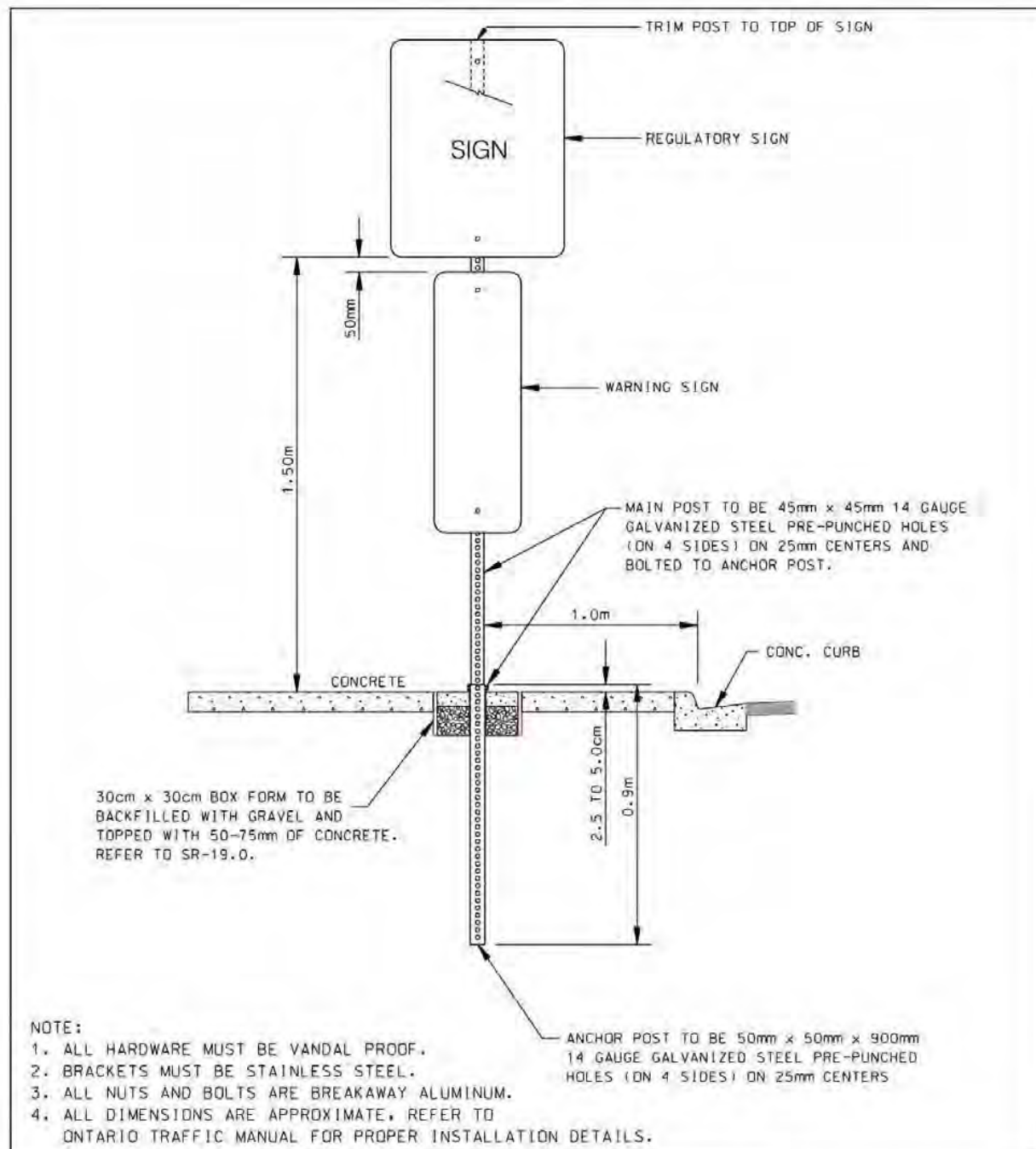
2012 12 03

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CITY ENGINEER

*Justin Lawrence*  
Justin Lawrence



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CITY OF LONDON STANDARD DRAWING

TYPICAL SQUARE POST AND  
ANCHOR POST INSTALLATION DETAIL

DWG

SR-19.3

DATE

2012 12 03

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CITY ENGINEER

*Justin Lawrence*  
JUSTIN LAWRENCE

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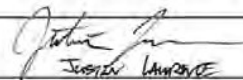


Sign	Sheeting Requirement	Post Requirements
All-Way Tab	Diamond Grade	Round Post
Checkerboard	Diamond Grade	4x4 Wooden Post, Square Post or Round Post
Construction Arrow	Diamond Grade	"Portable" on 2x4 Skis
Daytime Hazard	Diamond Grade	Square Post with Anchor Post
Do Not Enter	Diamond Grade	Barricade Board, Hydro Poles
No Right Turn	Diamond Grade	Hydro Poles, Street Light Poles, Round Posts
One Way Arrow	Diamond Grade	Hydro Poles, Street Light Poles, Round Posts
2-Way Traffic	Diamond Grade	"Portable" on 2x4 Skis
School Area	Diamond Grade	U-Channel or Mounted on Hydro-Street Light Pole
School Crossing	Diamond Grade	U-Channel or Mounted on Hydro-Street Light Pole
School Crossing Ahead	Diamond Grade	Square Post with Anchor Post
Stop Sign	Diamond Grade	Round Post
Yield Sign	Diamond Grade	Round Post
Chevrons	Florescent Diamond Grade	Guard Rails, 4x4 Wooden Posts or Square Posts
Chevron Alignment	Florescent Diamond Grade	Guard Rails, 4x4 Wooden Posts or Square Posts
Island Marker	Florescent Diamond Grade	Square Post with Anchor Post
Hazard Marker	Florescent Diamond Grade	Square Post with Anchor Post
Begins Tab	High Intensity Prismatic	U-Channel, Utility Poles
Bike Lane	High Intensity Prismatic	U-Channel, Utility Poles
Caution Playground	High Intensity Prismatic	U-Channel, Utility Poles
Curve	High Intensity Prismatic	U-Channel, Utility Poles
Hospital "H"	High Intensity Prismatic	U-Channel, Utility Poles
No Exit	High Intensity Prismatic	U-Channel, Utility Poles
No Right Turn On Red	High Intensity Prismatic	Traffic Signal Arm or Mast Pole
No Truck Route	High Intensity Prismatic	U-Channel, Utility Poles
Pedestrian Crossing	High Intensity Prismatic	U-Channel, Utility Poles
Right Lane Ends/Through Lane	High Intensity Prismatic	U-Channel or Wooden Posts
Railroad Crossing	High Intensity Prismatic	U-Channel, Utility Poles
Street Name/Advanced	High Intensity Prismatic	U-Channel or Wooden Posts
Signals Ahead	High Intensity Prismatic	U-Channel or Wooden Posts
Speed Limit Signs	High Intensity Prismatic	U-Channel or Wooden Posts
Stop Ahead	High Intensity Prismatic	U-Channel or Wooden Posts
Through Traffic Left	High Intensity Prismatic	U-Channel or Wooden Posts
Tourism Signs	High Intensity Prismatic	U-Channel or Wooden Posts
Truck Route	High Intensity Prismatic	U-Channel or Wooden Posts
No Dumping	Engineers Grade	U-Channel
Loading Zone	Engineers Grade	U-Channel
No Parking	Engineers Grade	U-Channel
No Parking Wheel Chairs Only	Engineers Grade	U-Channel
No Stopping	Engineers Grade	U-Channel
Parking	Engineers Grade	U-Channel
School Bus Loading Zone	Engineers Grade	U-Channel, Round Post or Street Light Poles
No Parking Bus Stop	Engineers Grade	U-Channel

CITY OF LONDON STANDARD DRAWING


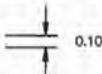

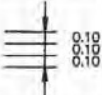

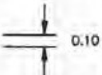

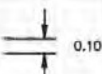

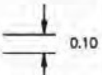
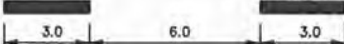
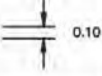
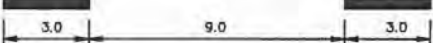
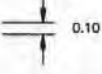

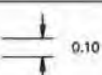

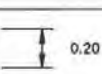
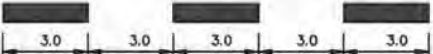
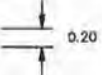
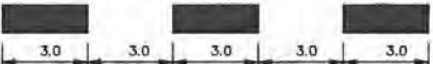
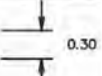
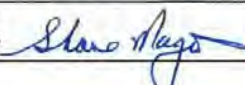
## SIGN SHEETING AND POST REQUIREMENTS





DWG SR-19.4 DATE 2012 12 03 APPROVED BY CITY ENGINEER



Susan Lawrence

...\\CONST\\NCONS-STD.DGN 12/14/2012 3:39:40 PM

NAME OF LINE		DIMENSIONS (m)		SYMBOL	USE
LONGITUDINAL	SOLID			1	EDGE, DIRECTIONAL DIVIDING LINES (YELLOW)
	DOUBLE SOLID			2	DIRECTIONAL DIVIDING LINES (YELLOW)
	BROKEN			3	DIRECTIONAL DIVIDING LINES (YELLOW)
	SOLID			5	EDGE, LANE LINE PROHIBITING LANE CHANGES (WHITE)
	BROKEN			6	URBAN LANE LINES, LOW SPEED (WHITE)
	BROKEN			7	URBAN LANE LINES, LOW SPEED (WHITE)
	BROKEN			8	LANE LINES HIGH SPEED HIGHWAY (WHITE)
	CONDENSED BROKEN			10	GUIDING LINES (E.G. INTERSECTION MOVEMENTS) (WHITE)
				10A	
	WIDE BROKEN			11	CONTINUITY LINES (WHITE)
			12		
CITY OF LONDON STANDARD DRAWING					
TYPES OF PAVEMENT MARKINGS					
DWG SR-20.0-A		DATE 2015 02 25		APPROVED BY CITY ENGINEER 	

NAME OF LINE		DIMENSIONS (m)	SYMBOL	USE
TRANSVERSE	LADDER	 0.60	15	LADDER CROSSWALKS (WHITE)
	STOP	 0.40	16	INTERSECTION STOP LINES (WHITE)
	CROSSWALK	 0.10	17	CROSSWALKS (WHITE)
	CROSSWALK	 0.20	18	CROSSWALKS (WHITE)
SYMBOLS			20	VARIOUS
LIMIT OF MARKINGS		] [		
<p>NOTES:</p> <p>1. Use ① to Denote PAVEMENT MARKING</p> <p>2. Use ① to Denote PAVEMENT MARKING, TEMPORARY</p> <p>3. Use ⚠ to Denote PAVEMENT MARKING, TEMPORARY-REMOVABLE</p> <p>4. Use ① to Denote PAVEMENT MARKING, DURABLE</p>				
CITY OF LONDON STANDARD DRAWING				
TYPES OF PAVEMENT MARKINGS				
DWG SR-20.0-B	DATE 2015 09 21	APPROVED BY CITY ENGINEER 