

**PART 1 GENERAL****1.1 Summary**

- .1 Unless otherwise indicated, follow the standards below when specifying exterior lighting for landscape use. These standards are not intended to restrict or replace professional judgment.

**1.2 Related Sections**

- .1 This section should be read in conjunction with section **26 50 00** Éclairage, where quantitative performance criteria are specified, this replaces section 32 37 50 Exterior Lighting.
- .2 2011 lighting Master Plan, by CS Design, available upon request.

**1.3 Design Requirements****.1 Light pollution**

- .1 In order to meet LEED® credit requirements, considerations must be made to meet uplight and light trespass requirements, using either the backlight-uplight-glare (BUG) method or the calculation method. The requirements must be met for all exterior luminaires using:
  - .1 The photometric properties of each luminaire once mounted in the specified orientation and tilt.
  - .2 LZ-2 lighting zone as defined in the IES/IDA Model Lighting Ordinance (MLO) User Guide.
- .2 In all conditions where LEED® credit requirements for light pollution are not targeted, BNQ 4930-100-2016 or equally restrictive local code applies;
  - .1 Downtown campus: Urban; 100,000 residents, ZEN-3/D zone applies
  - .2 MacDonald Campus:
  - .3 Gault Estate:

**.2 Spacing – Positioning - Installation**

- .1 Spacing between light fixtures is to be determined by the measured output of the light fixtures and the desired illumination level. Refer to, “average maintained” Illumination Levels set out in section DIV 26 50 00
- .2 Post will be in hot dip galvanized steel or equivalent structural strength, height as per lighting designer, minimal diameter is 193mm outside, steel thickness is 4 mm minimal
- .3 120V-GFCi outlet to be provided at the base, as well at top of post for seasonal event requiring outlet for special temporary lighting.
- .4 Position of any ground equipment should be away from possible vehicular damage, they should be moved away or being protected by concrete bollard.
- .5 Designer has to coordinate with McGill Ground Dept, so that equipment does not hinder their snow removal work.
- .6 Any ground equipment supported equipment should not have the mounting bolts encased in concrete or recessed into road material

- .7 Concrete bases shall have at least 2440mm height, with at least 200mm above grade, to avoid new climate change freezing depth problems, provide K-LOK, grounding rod, hot dip galvanize 500mm min length, stainless steel is recommended.
- .8 Pre-cast 2x50mm PVC piping shall terminate at 915mm below top of top of base,
- .9 Concrete bases bolts shall be stainless steel 304 minimal, 316 preferred
- .10 Underground electrical wiring shall be PVC conduit, Teck is permitted for repairs.
- .11 Conduits or Teck shall be 1 meter below grade.
- .12 Red warning Tape shall be installed midway, from grade to conduit/cable. In high-risk areas, concrete plank shall be installed just above conduit.
- .13 Les connexions dans l'équipement seront :
  - .1 De type à joints comprimés, avec ruban caoutchouté T&B ou mieux, et ruban adhésif Scotch 88 ou mieux
  - .2 Des connecteurs 5A seront incorporés à la base de l'équipement, la base signifie 15 à 30 cm du sol, ces fusibles seront des selon le CÉQ 30-1008, ces dispositifs seront accessibles par un couvert encastré dans l'équipements, sous verrous d'entretien, clé triangulaire ou équivalent, à coordonner avec McGill.
  - .3 Même, si les raccords sont internes à l'équipement, McGill exige une protection de IP66 minimale pour les joints et fusibles.
- .3 Circulation Lighting
  - .1 Lighting Roadways
    - .1 All streets or roads dedicated to vehicular circulation.
      - .1 For the location of vehicular roadways, refer to the document "Special Building Standards – Landscape".
    - .2 Roadways are to be lit with the use of street lampposts.
    - .3 Traffic lighting may be required
  - .2 Lighting Sidewalks
    - .1 All pedestrian paths along the side of a street or a road. It is a space separated from vehicular circulation.
    - .2 Sidewalks are to be lit with the use of street lampposts.
  - .3 Lighting Pedestrian Pathways
    - .1 All paths that pass-through lawn areas.
    - .2 Pedestrian pathways are to be lit with the use of pedestrian lampposts.
    - .3 Where free-standing fixtures cannot be installed, surface mounted fixtures may be used where the context permits.
  - .4 Shared Pathways
    - .1 All pedestrian pathways that are shared with occasional vehicles such as emergency or service vehicles. Shared spaces on campus are the main roads connecting streets to the Campus buildings entrances, loading areas, and egress points.

- .2 Shared pathways are to be lit with the use of street lamp posts or bollards, depending on the context.
- .3 Where free-standing fixtures cannot be installed, surface mounted fixtures may be used where the context permits.
- .4
- .5 **Bicycle Circulation**
  - .1 This category includes all cycling infrastructure consisting of marked lanes, tracks, shoulders and paths designated for use by cyclists and from which motorized and pedestrian traffic is generally excluded.
  - .2 Dedicated bicycle circulation lanes are to be lit with the use of street lamp posts, pedestrian lamp posts or bollards, depending on the context.
  - .3 Where free-standing fixtures cannot be installed, surface mounted fixtures may be used where the context permits.
- .6 **Parking Areas**
  - .1 This category includes all designated outdoor parking areas on campus for faculty, staff, students and/or service vehicles.
  - .2 Parking areas are to be lit with the use of street lampposts or surface mounted light fixtures depending on the context.
- .4 **Lighting Places**
  - .1 **Entrances of Buildings**
    - .1 The space in front of the entrance of a building that acts as the threshold of the building. This category includes all the buildings of the campus, both heritage and contemporary.
    - .2 Entrances of buildings are to be lit with the use of surface mounted light fixtures or integrated light fixtures, depending on the context.
  - .2 **Building Facades**
    - .1 All the buildings of the campus, both heritage and contemporary.
    - .2 Building facades are to be lit with the use of surface mounted light fixtures or integrated light fixtures, depending on the context.
    - .3 Optical accessories such as louvers and cut-off visors should be considered to control light spill and focus the majority of the light on the intended target.
    - .4 Lamp colour temperature should be harmonized with the building material via onsite mockup, where fixture samples are procured and effect of light on surfaces is documented.
    - .5 Relative intensity vs. context: Buildings should be lit not more than 3 times more intensely than its neighbor unless approved by the Architecture & Planning Advisory Committee as an important focal building.
  - .3 **Shared Open Places**
    - .1 All quads, squares, gardens, terraces and lawns of the campus.
    - .2 Building facades are to be lit with the use of integrated light fixtures.

- .4 Gates
  - .1 All lighting mounted on gates, portals and fences on campus. The gates, portals and fences are located at the entries and site limits of the campus.
    - .1 For details on gates, refer to the document “Special Building Standards – Landscape”.
  - .2 Gates are to be lit with the use of surface mounted light fixtures or integrated light fixtures, depending on the context.
- .5 Building Service Areas
  - .1 All service areas surrounding buildings, including but not limited to secondary entrances, emergency exits and loading bays.
  - .2 Building service areas are to be lit with the use of surface mounted light fixtures or integrated light fixtures, depending on the context.
- .5 Accent Lighting
  - .1 Permanent Art Work
    - .1 Commemorative elements such as monuments, historical plaques and statues as well as contemporary art work that are meant to be permanently installed on campus.
    - .2 Permanent artwork is to be lit with the use of surface mounted light fixtures or integrated light fixtures, depending on the context.
    - .3 Lighting designer / Engineer undertakes to mockup (test on site) lighting of art work using samples of proposed fixtures, after sundown. Photographic record of mockup shall be submitted to Architecture & Planning Advisory Committee for comment and approval.
  - .2 Temporary Art Work
    - .1 All types of temporary art work such as ephemeral installations and temporary exhibits which require particular lighting.
    - .2 Temporary artwork to be lit with the use of surface mounted light fixtures. Lighting strategies for these works will be evaluated by the designer, representatives of McGill Operations and Maintenance as well as the approval body which authorized the installation of the work.
  - .3 Signage and Wayfinding
    - .1 This category includes all campus signage and wayfinding elements which are meant to be distinguished at night.
    - .2 Signage to be lit with the use of built-in fixtures, glare control must be integrated.
  - .4 Traffic lights
    - .1 Work shall be coordinated with Security Dept of McGill, Camera may be required.

**1.4 Illumination Levels**

See section Lighting 26 50 00

**1.5 Technical References**

- .1 For source recommendations, and electrical distribution see McGill Standard Construction specification, Division 26 50 00.
- .2 For the required ingress protect rating for exterior fixtures, see McGill Standard Construction specification, Division 26 50 00.
- .3 For a list of required certifications, see McGill Standard Construction specification, Division 26.
- .4 For colour temperature (CCT) recommendations, see McGill Standard Construction specification, Division 26 50 00. When lighting building facades, lighting colour temperature should be harmonized with building materials.
- .5 For fixture cut-off recommendations see night sky compliance, as per applicable standard (1.3.1)

**PART 2 PRODUCTS****2.1 McGill Standard Collection**

- .1 All standard, modified and custom fixture types must meet requirements of DIV 26 50 00 fixture design criteria, 120V for all exterior lighting, unless a low voltage solution is proposed. Any glass shall be tempered, too avoid safety issues.
- .2 Street Lamp Posts
  - .1 Model
    - .1 “City Elements CE180/AR800/1LV-1LEVO Module”, as fabricated by HESS, or approved equivalent by “SCHREDER or others”.
      - .1 Mounting option: external flange, this implies access to anchoring bolts (due to electrical conduit diameter), Non-accessible or Recessed bolts in ground is not permitted.
      - .2 Colour: RAL #7016 Anthracite Grey; marine grade finish
      - .3 Light colour temperature: WW-3000K.
      - .4 Hardware: stainless steel.
      - .5 Distribution: ME-Type III., with majority of light on path of travel
      - .6 For all external and internal services to be integrated in poles, minimally:
        - .1 One dedicated 120V-20A, GFI outlet at the base, concealed at the base, 2 x USB-A at the base accessible and rated “weather proof”, one dedicated outlet a the top for Building Services, used for special events, like special accent lighting for events, to be concealed inside a IP66 cover.
      - .7 Coordinate with McGill University IT services, DIV 27 Telecom / AV to determine frequency and model of Wi-Fi antennae and security cameras. All antennae are to be internally integrated into the light pole body.

- .8 Whenever possible, lamp post anchoring bolts shall be concealed by a two part stainless steel (6mm thick), square bolt cover painted with RAL #7016 Anthracite Grey; marine grade finish, any digression from this will be refused.
- .3 Pedestrian Lamp Posts
  - .1 Model
    - .1 Refer to Street lamp post model in article 2.1.2.1 above.
- .4 Bollards which contain a light source
  - .1 McGill Standard Collection
    - .1 Model “City Elements CE180/P3.5/AR”, as fabricated by HESS, or approved equivalent by “SCHREDER or others”.
      - .1 Mounting option: external flange (due to electrical conduit diameter) , Non-accessible or Recessed bolts in ground is not permitted..
      - .2 Colour: RAL #7016 Anthracite Grey.
      - .3 Light colour temperature: WW-3000K.
      - .4 Hardware: stainless steel.
      - .5 Distribution: ME-Type III, with majority of light on path of travel.
      - .6 Whenever possible, lamp post anchoring bolts shall be concealed by a two part stainless steel (6mm), square bolt cover painted with RAL #7016 Anthracite Grey; marine grade finish
- .5 Surface Mounted Light Fixtures
  - .1 This includes, but is not limited to, accent lighting, light fixtures mounted on campus building or structures.
  - .2 Surface mounted light fixtures are typically found at the entrances or egress points of buildings, as well as on the facades of buildings to light adjacent pathways.
  - .3 Fixture cabling:
    - .1 Avoid surface mounted cabling wherever possible, the suggested method is to drill directly behind the fixture
    - .2 If visible cabling is required, cabling must be concealed from view, of minimal length and painted to match supporting surface
    - .3 All visible surface mounted cabling must be rigid aluminum. No PVC or Tech is permitted. Rigid Aluminum conduit must be painted in a factory, doing an anodizing aluminum oxide paint process as per the architect choice. If visible cabling is required, cabling must be concealed from view, of minimal length and painted to match supporting surface
  - .4 Examples of fixtures
    - .1 COOPER XTORxB-W-PC1-HA, where x is power level, W=3000K, PC1=120V built-in photocontrol, HA=high ambient temperature
    - .2 Or equivalent, that respect section 26 50 00
- .6 Integrated Light Fixtures

- .1 This includes, but is not limited to, accent lighting, facade lighting, tree lighting, step lighting, handrail lighting, etc.
- .2 Must respect section 26 50 00 and the present section.

## 2.2 Custom designed lighting

- .1 Custom-designed lighting may be used in exceptional circumstances, but design must be approved by Architecture & Planning Advisory Committee.
  - .1 The decision-making process regarding the replacement or restorations of the light fixtures should be based on the following factors:
    - .1 If its value is **heritage**, restoration should be prioritized, even if the cost is higher. If it can't be restored, it should be rebuilt with identical design and construction. Work to be performed by PRODUITS NOMIS or approved equivalent, via McGill.
    - .2 If its value is **non heritage**, either repaired, rebuilt identically or with a brand new design. Work to be performed by PRODUITS NOMIS or approved equivalent, via McGill.
    - .3 If it is a **new** pedestrian lamp post, its style and materiality should be in relation to its context: either with a contemporary style or a more heritage approach.
  - .2 All fixtures should distinguish themselves as being unique to McGill University. This can be achieved through subtle and elegant custom detailing to reinforce the prestige of the university.
    - .1 Example of heritage style detailing:
      - .1 A McGill crest on the access panel on the base.
    - .2 An example of contemporary style detailing:
      - .1 A McGill red fillet in the shaft at handrail height introducing the pedestrian scale and creating a guiding ribbon throughout the campus. This separation also subtly mirrors the tripartite classical composition.
- .2 Street Lamp Posts
  - .1 The scale of street lamp posts present on campus should be proportional to the setting as well as adjacent lamp posts by the City of Montreal. The height range of McGill street lamp posts should be between 3 and 4 m.
  - .2 Spacing between street lamp posts is to be determined by the measured output of the light fixtures as well as circulation needs. Refer to DIV 26 50 00 and above normal Lamp Posts.
  - .3 Street lamp posts should be finished in dark grey powder coat so as to blend into the night sky.
    - .1 Preferred colour: #7016 Anthracite grey.

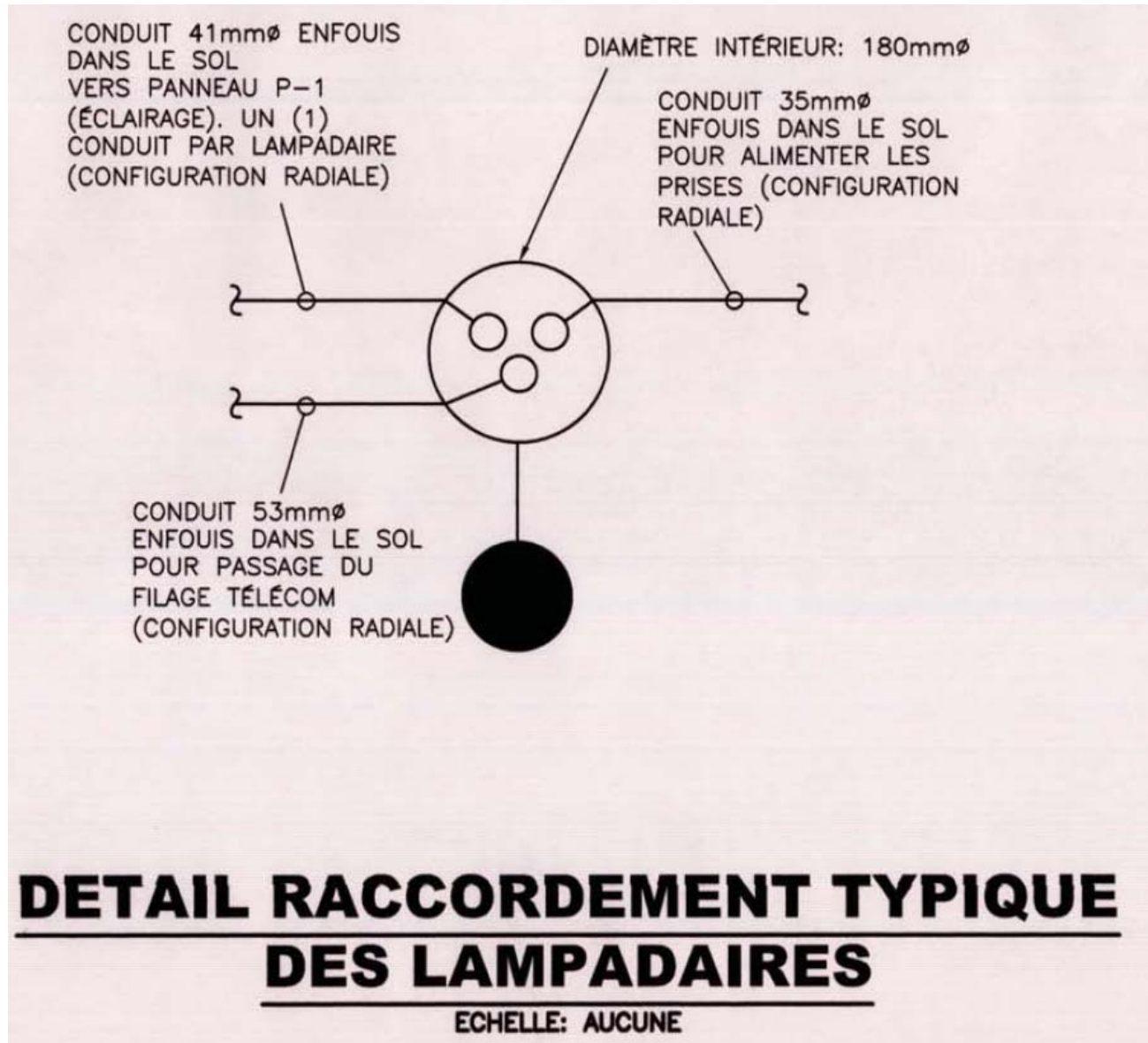
- .4 Depending on the context, the street lamp post can be either **heritage** or **contemporary**.
  - .1 **Heritage** style fixtures should consist of the following attributes:
    - .1 tripartite construction (base, shaft & capital);
    - .2 base: sand-cast articulated base (to accentuate the play of light and reference the detailing of adjacent buildings);
    - .3 capital: lantern with rectilinear faceted geometry;
    - .4 diffuse glow: refer to the historic gaslight;
    - .5 using similar light intensity, color and distribution as the historic source it references;
    - .6 single or multiple lanterns with horizontal bracket arms below the lantern.
  - .2 **Contemporary** style fixtures should consist of the following attributes:
    - .1 monolithic construction;
    - .2 platonic geometry;
    - .3 directional shielded light;
    - .4 single lamp head on shaft.
- .3 Pedestrian Lamp Posts
  - .1 The scale of pedestrian lamp posts present on campus should be proportional to the setting. The height range of pedestrian lamp posts should be between 3 and 4 m.
  - .2 Spacing between pedestrian lamp posts is to be determined by the measured output of the light fixtures as well as circulation needs. Refer to DIV 26 50 00
  - .3 Pedestrian lamp posts should be finished in gloss black or dark grey powder coat so as to blend into the night sky.
    - .1 Preferred colour: #7016 Anthracite grey.
  - .4 Depending on the context, the pedestrian lamp post can be either **heritage** or **contemporary**.
    - .1 **Heritage** style fixtures should consist of the following attributes:
      - .1 tripartite construction (base, shaft & capital);
      - .2 base: sand-cast articulated base (to accentuate the play of light and reference the detailing of adjacent buildings);
      - .3 capital: lantern with rectilinear faceted geometry;
      - .4 diffuse glow: refer to the historic gaslight;
      - .5 using similar light intensity, colour and distribution as the historic source it references;
      - .6 single or multiple lanterns with horizontal bracket arms below the lantern.
    - .2 **Contemporary** style fixtures should consist of the following attributes:

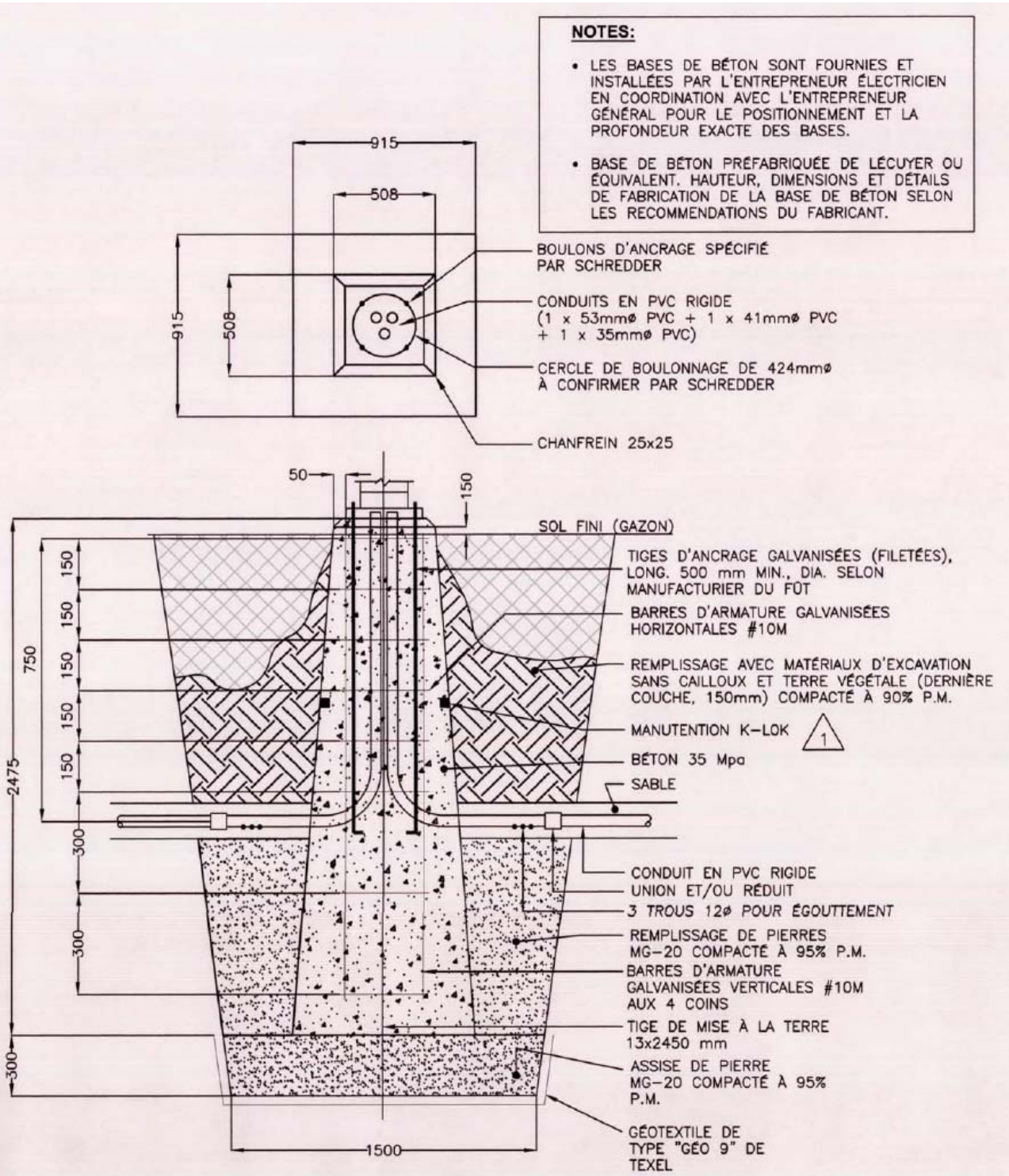


- .1 monolithic construction;
  - .2 platonic geometry;
  - .3 directional shielded light;
  - .4 single lamp head on shaft.
- .4 Bollards which contain a light source
- .1 Scale should be consistent with bollards which do not contain light sources. All campus bollards should maintain a consistent height throughout the campus. See section 32 37 00 – Exterior Furnishings.
  - .2 Spacing between bollards is to be determined by the measured output of the light fixtures as well as circulation needs. Refer to DIV 26 50 00 and above normal Bollard Posts.
  - .3 Bollards should be finished as with a dark grey colour, so as to blend into the night sky.
    - .1 Preferred colour: #7016 Anthracite grey, glossy finish.
  - .4 The fixture style should be, similar to the family of fixtures found in the same context. The fixture style should be consistent with bollards which do not contain light sources.
  - .5 Detailing should be consistent with bollards which do not contain light sources.
  - .6 Whenever possible, bollard anchoring shall not be visible, but accessible for maintenance of bolts, if they are not stainless steel.
- .5 Surface Mounted Light Fixtures
- .1 This includes, but is not limited to, accent lighting, light fixtures mounted on campus building or structures.
  - .2 Surface mounted light fixtures are typically found at the entrances or egress points of buildings as well as on the facades of buildings to light adjacent pathways.
  - .3 The scale of surface mounted light fixtures should be proportional to the building or structure on which they are mounted.
  - .4 Surface mounted light fixtures should be finished in a complementary manner to the surface upon which they are mounted and match existing architectural hardware finishes. Where surface conduit is used, it should also be painted (anodized in a factory) to blend in with the surface upon which it is mounted.
  - .5 Depending on the context, the fixture style can be either **heritage** or **contemporary**.
    - .1 Heritage style fixtures should consist of the following attributes:
      - .1 lantern with rectilinear faceted geometry;
      - .2 diffuse glow: refer to the historic gaslight;
      - .3 using similar light intensity, colour and distribution as the historic source it references;
      - .4 single or multiple lanterns with horizontal bracket arms below the lantern;
      - .5 material must match the existing hardware;

- .2 Contemporary style fixtures should consist of the following attributes:
  - .1 monolithic construction;
  - .2 platonic geometry;
  - .3 directional shielded light;
  - .4 single lamp head on shaft.
  
- .6 Integrated Light Fixtures
  - .1 This includes, but is not limited to, accent lighting, facade lighting, tree lighting, step lighting, handrail lighting, etc.
  - .2 By definition, heritage fixtures are designed to be expressed. They are distinct, radiant, decorative elements within the campus landscape. By contrast, contemporary fixtures should be integrated whenever possible.
  - .3 The scale of integrated fixtures should be responsive and proportional to the space or object which is being lit.
  - .4 Light fixtures which are integrated within urban furniture, paving materials, building facades, etc. should be concealed from sight lines. Where surface conduit is used, it should also be painted to blend in with the surface upon which it is mounted.

**END OF SECTION**



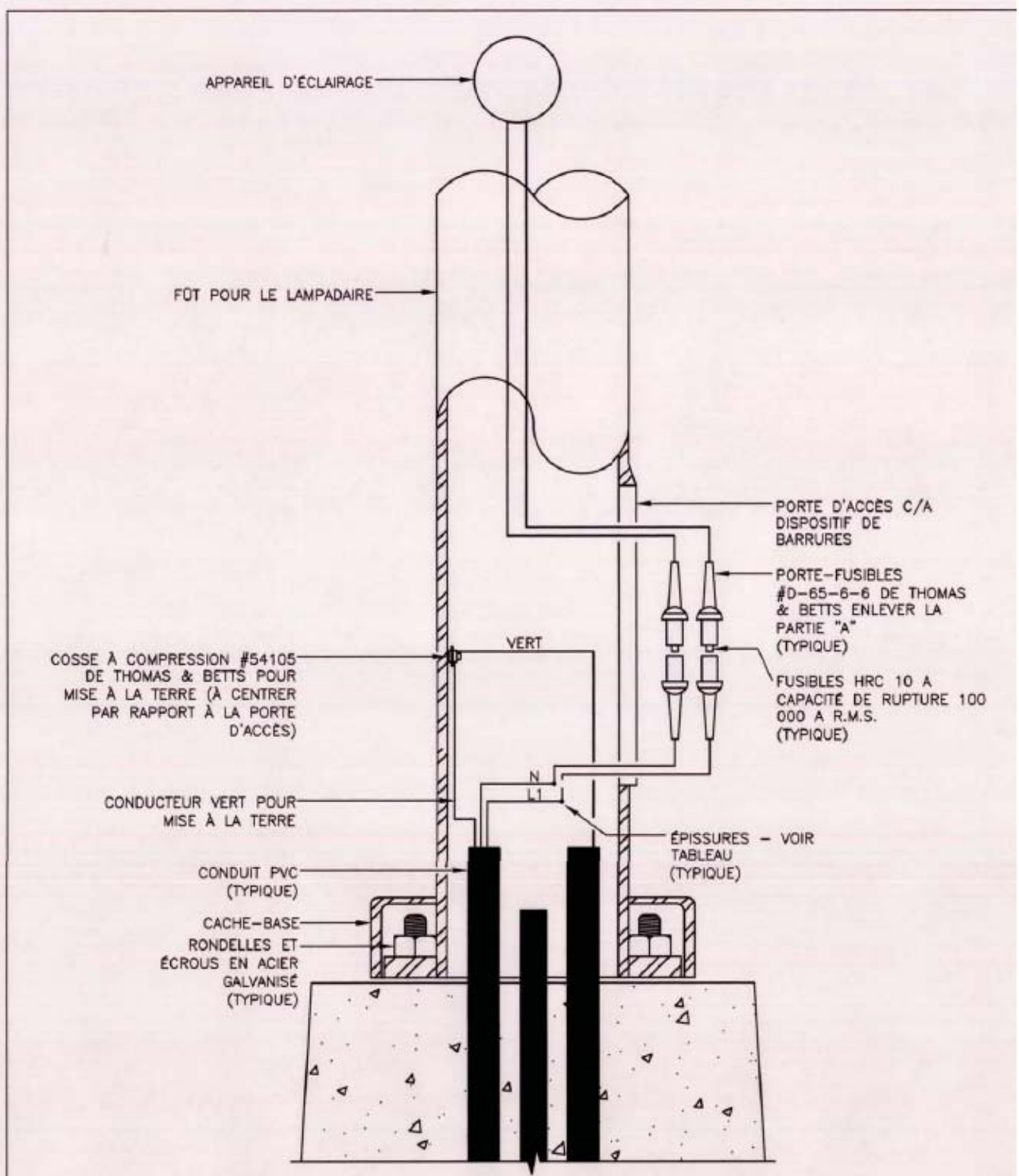


A  
E-07

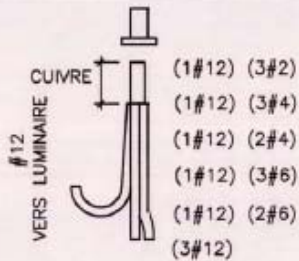
**DÉTAIL DE BASE DE BÉTON ARMÉE PRÉFABRIQUÉE POUR LAMPADAIRE**

ECHELLE: AUCUNE





## ÉPISSURE



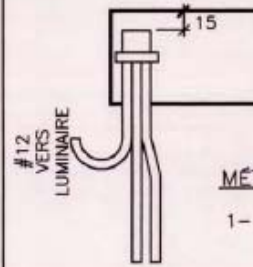
**NOTE:**

COMPRESSER LE MANCHON AVEC L'OUTIL APPROPRIÉ. LES CÂBLES MONOCONDUCTEURS NE DOIVENT PAS EXCÉDER LE RACCORD.

MANCHON À COMPRESSION AVEC CODE DE COULEUR

THOMAS & BETTS SÉRIE "54600"	BURNDY SÉRIE "YSM__CG"
JAUNE	JAUNE
ORANGE	ORANGE
ROSE	ROSE
VERT/ROSE	VERT
BRUN	BRUN
BLEU	BLEU

FIGURE 1



**MATÉRIAUX**

UNE ENVELOPPE ISOLANTE ADHÉSIVE THOMAS & BETTS MODÈLE: AC5x3 (POUR MANCHONS BLEU À NOIR) AC5x7 (POUR MANCHONS SUPÉRIEURS)

**MÉTHODE D'INSTALLATION**

- 1- INSTALLER LE MANCHON SUR L'ENVELOPPE ISOLANTE À L'ENDROIT INDIQUÉ. LA TEMPÉRATURE DE L'ENVELOPPE DOIT ÊTRE D'ENVIRON 20°C LDERS DE L'INSTALLATION.
- 2- REPLIER LE COIN SUPÉRIEUR GAUCHE DE L'ENVELOPPE SUR LE MANCHON.
- 3- ENROULER L'ENVELOPPE AUTOUR DU MANCHON ET LA COMPRESSION FERMEMENT.
- 4- ÉCARTER LES CÂBLES ET PRESSER L'ENVELOPPE ENTRE CES DERNIERS.

FIGURE 2



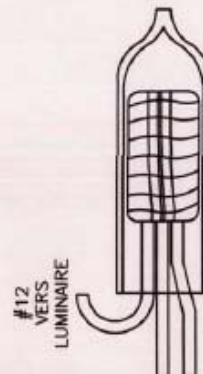
**MATÉRIAUX**

RUBAN ADHÉSIF "SUPER 88 SCOTCH"

**MÉTHODE D'INSTALLATION**

- 1- PASSER QUELQUES RANGS DE RUBAN DE HAUT EN BAS ENTRE LES CÂBLES ÉCARTÉS.
- 2- RESERRER LES CÂBLES ENSEMBLES ET PASSER SUR TOUTE L'ÉPISSURE TROIS (3) RANGS MINIMUM DE RUBAN À L'HORIZONTALE EN CHEVAUCHANT DE MOITIÉ CHAQUE RANG.

FIGURE 3



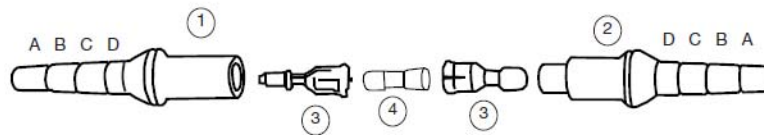
CAPUCHON PROTECTEUR AMOVIBLE EN POLYÉTHYLÈNE RIGIDE, DONT LE DIAMÈTRE S'AJUSTE À CELUI DE L'ÉPISSURE. PLACER À LA VERTICALE DANS LE FÔT, LA TÊTE VERS LE HAUT.

FIGURE 4

## Break-away Connector Kits

### Installation Instructions for 65 and D65 Fused Connector Kit

- Contents:**
- 1. Line side (female) rubber housing
  - 2. Load side (male) housing
  - 3. Metal Fuse Sockets (4 in D65 Kits)
  - 4. Fuse (not provided)
  - Assembly Dowel
  - Lubricant
  - Wiper



#### Outside Diameter

Cable OD (in.)	
A	0.120 - 0.205
B	0.195 - 0.260
C	0.250 - 0.330
D	0.320 - 0.430

Table 1

#### Universal Contact



Crimp Area	Conductor Size in AWG		Recommended Crimp Tools & Dies	
	Stranded	Solid		
A	14	12, 14	T&B No. WT111M	"C" Cavity
	10, 12	8, 10		
B	6	6	T&B No. TBM41E/45S	"Blue" Cavity
	6	4		

Table 2

