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| **1. Informations diverses** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No de dossier (contrat): | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | |  | | | | | | | Route: | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | |  | Obstacle: | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  |
| No de plan: | | | | | | | | | | | | | | | | PO- | | | | | | | | | | | | | |  | | | | | | | Municipalité: | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | |  | Entrepreneur: | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  |
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| **2. INFORMATIONS SUR LES BOULONS UTILISÉS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Fournisseur des boulons assemblés**: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Lot de production de boulons assemblés: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  |
| **Fabricants** | | | | | | | | Boulons: | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Rondelles: | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | Écrous: | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | |  |
| Type de boulon: | | | | | | | | | | | | | | | A 325 | | | | | | | | | | | | A 490 | | | | | | | | | | | Diamètre (D): | | | | | | | | | | | | |  | | | | | | | | | mm | | | | | | | Longueur (L): | | | | | | | | | | |  | | | mm | | | | | | | Nombre de rondelles (NR): | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | |  |
| Type de protection: | | | | | | | | | | | | | | | Aucune (type 1) | | | | | | | | | | | | | | | | | | | | | | | Galvanisé à chaud | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | Résistant à la corrosion (type 3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | |  |
| Contenants scellés | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | Identification conforme | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | |  |
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| **3. INFORMATIONS SUR LE TENSIOMÈTRE UTILISÉ** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Certificat d’étalonnage daté du (< 12 mois): | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | /    / | | | | | | | | | | | | | | | | |  | | | | Par: | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | |
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| Modèle no: | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Série no: | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Lecture au manomètre (lbs ou N): | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | |  |
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| **4. TENSION EXIGÉE (lbs) SELON LE TYPE DE BOULON ET SON DIAMÈTRE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  |  | | | | | | | |  | | | | | | | | | | | | | | | | | **⅝ " Ø** | | | | | | | | | | | | | **¾ " Ø** | | | | | | | | | | | | | | | | **⅞ " Ø** | | | | | | | | | | | | | | | | **1 " Ø** | | | | | | | | | | | | | | **1 ⅛" Ø** | | | | | | | | | | | | | | | | | **1 ¼" Ø** | | | | | | | | | | | | | | | | | |  |
|  | **A 325** | | | | | | | | Serrage à bloc1 | | | | | | | | | | | | | | | | | 2 250 à 3 400 | | | | | | | | | | | | | 3 350 à 5 050 | | | | | | | | | | | | | | | | 4 650 à 7 000 | | | | | | | | | | | | | | | | 6 100 à 9 150 | | | | | | | | | | | | | | 6 700 à 10 050 | | | | | | | | | | | | | | | | | 8 500 à 12 700 | | | | | | | | | | | | | | | | | |  |
|  |  | | | | | | | | Serrage final 2 | | | | | | | | | | | | | | | | | 19 000 | | | | | | | | | | | | | 28 000 | | | | | | | | | | | | | | | | 39 000 | | | | | | | | | | | | | | | | 51 000 | | | | | | | | | | | | | | 64 900 | | | | | | | | | | | | | | | | | 82 400 | | | | | | | | | | | | | | | | | |  |
|  | **A 490** | | | | | | | | Serrage à bloc1 | | | | | | | | | | | | | | | | | 2 900 à 4 300 | | | | | | | | | | | | | 4 200 à 6 300 | | | | | | | | | | | | | | | | 5 850 à 8 800 | | | | | | | | | | | | | | | | 7 700 à 11 500 | | | | | | | | | | | | | | 9 600 à 14 400 | | | | | | | | | | | | | | | | | 12 200 à 18 350 | | | | | | | | | | | | | | | | | |  |
|  |  | | | | | | | | Serrage final 2 | | | | | | | | | | | | | | | | | 24 000 | | | | | | | | | | | | | 35 000 | | | | | | | | | | | | | | | | 49 000 | | | | | | | | | | | | | | | | 64 000 | | | | | | | | | | | | | | 80 000 | | | | | | | | | | | | | | | | | 102 000 | | | | | | | | | | | | | | | | | |  |
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| **5. ANGLE DE ROTATION (R) DE L’ÉCROU AU SERRAGE FINAL** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | Si L ≤ 4D R = ⅓ de tour | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | |
|  | Si 4D < L ≤ 8D ou L ≤ 200 mm R = ½ de tour  3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | |
|  | Si L > 8D ou L > 200 mm R = ⅔ de tour | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | |
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| **6. TENSION MESURÉE (lbs) – ESSAIS SUR 3 BOULONS ASSEMBLÉS (GALVANISÉS OU NON)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  |  | | | | | | | | | | | **Serrage à bloc (lbs)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **\* Serrage final (lbs)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **\* Serrage final + 30 º (lbs)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |
|  | Boulon no 1 | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |
|  | Boulon no 2 | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |
|  | Boulon no 3 | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |
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|  | **\*** Les tensions dépassant celles indiquées du bloc 4 ne doivent pas constituer une cause de rejet | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | |
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| **7. ESSAI DE CAPACITÉ DE ROTATION, BOULONS ASSEMBLÉS GALVANISÉS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | Mention de la conformité à l’essai de capacité de rotation pour le lot de boulons galvanisés indiquée sur l’attestation de conformité  (réf. : CCDG article 15.8.4.3.1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  | Conforme | | | | | | | | | | | | |  | | | | | Non-conforme | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | |
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| **8. CONFORMITÉ DU LOT DE BOULONS ASSEMBLÉS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | Conforme | | | | | | | | | | | | Non-conforme | | | | | | | | | | | | | | | Justification : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | |
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|  | Note : Voir *Manuel de construction et de réparation des structures* pour conformité du lot de production de boulons assemblés | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | |
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| **9. REMARQUES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **10. SIGNATURE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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***Référence : CCDG (article 15.8.4.3.2), CSA S6 (art. A10.1.6.7) et Manuel de construction et de réparation des structures, chapitre 8***

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| 1 Serrage à bloc : 15 % ± 3 % de la tension minimale exigée au serrage final (CSA S6 art. 10.2 et A10.1.6.8)  2 Serrage final : au moins 70 % de la résistance à la traction minimale du boulon (CSA S6 art. A10.1.6.4)  3 Consulter la Direction des structures si des problèmes particuliers sont rencontrés au serrage final lors de l’essai |  | **Légende :**  D = Diamètre du boulon  L = Longueur du boulon (sans la tête)  R = Rotation à partir du serrage à bloc (tous les boulons)  NR = Nombre de rondelles (par boulon assemblé) |