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|  | | | | | | | | | | | Fiche de conception – Murs de soutènement homologués | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  |  |  | **Identification de l’ouvrage** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No de la structure | | | | Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | Obstacle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| No de projet | | | | Municipalité | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| No de dossier | | | | Nom du produit | | | | | | | | | | | | | | | | | | | | | | | | | | | | Nom du fournisseur | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  |  |  | **Conception de l’ouvrage** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Conceptrice ou concepteur** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nom | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Compagnie | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Membre de l’Ordre des ingénieurs du Québec | | | | | | | | | | | | | Nombre d’années d’expérience en conception d’ouvrages d’art | | | | | | | | | | | | | | | | | | | | | | | | | | | Formation *Conception des structures* réussie | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No de membre | | | | | | | | | | | | | années | | | | | | | | | | | | | | | | | | | | | | | | | | | Oui, en date du       (aaaa-mm-jj) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Vérificatrice ou vérificateur** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nom | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Compagnie | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Membre de l’Ordre des ingénieurs du Québec | | | | | | | | | | | | | Nombre d’années d’expérience en conception d’ouvrages d’art | | | | | | | | | | | | | | | | | | | | | | | | | | | Formation *Conception des structures* réussie | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No de membre | | | | | | | | | | | | | années | | | | | | | | | | | | | | | | | | | | | | | | | | | Oui, en date du       (aaaa-mm-jj) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  | | | Une note de calcul claire et détaillée a été préparée et vérifiée par le (la) concepteur(-trice) et le (la) vérificateur(-trice) selon les exigences du Ministère. Cette note de calcul est disponible en tout temps à la demande du Ministère. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Étude géotechnique** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Réalisée par | | | | | | | | | | | | | | | | | | | | | | | | | | | | Compagnie | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Date (aaaa-mm-jj) | | | | | | | | | | |
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| **Logiciel de calcul utilisé** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Normes et manuels utilisés** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Norme CAN/CSA-S6 Version | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Manuel de conception des structures* Édition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Normes – Ouvrages routiers (tomes I à VIII) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Norme CAN/CSA A23.4 Édition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tome III – Ouvrages d’art* Mise à jour du (aaaa-mm-jj) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Devis type du Ministère Version | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tome VII – Matériaux* Mise à jour du (aaaa-mm-jj) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | CCDG Version | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tome VIII – Dispositifs de retenue* Mise à jour du (aaaa-mm-jj) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Autres | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Géométrie du mur (Joindre une coupe du mur à la fiche de conception, ou plusieurs, si le mur est à géométrie variable) :** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hauteur du mur : | | | | |  | | mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | Hauteur du remblai en arrière du mur : | | | | | | | | | | | | | | | | | | | |  | | | | | | | mm | | | | | | |
| Talus (β) : | | | | |  | | ° | | | | | | | | | | | | | | | | | | | | | | | | | | | | Fruit du mur : | | | | | |  | | | | | | ° | | | | | | | | | | | | | | | | | | | | | |
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| **Paroi du mur** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bloc de béton imbriqué | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Bloc de béton imbriqué avec connecteurs mécaniques | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gabion | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Acier | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Béton armé (mur en porte-à-faux) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Panneau en béton armé | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Treillis métallique | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Autres : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Béton** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Résistance en compression f’c : | | | | | | | | | | | | | | | | | | | | |  | | | | | | MPa | | | | | | | Poids volumique du béton armé : | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | kN/m3 | |
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| **Armature (dans le béton)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| fy :       MPa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Épaisseur de l’enrobage de l’armature : | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | mm | |
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| **Inclusions** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Types des inclusions (acier, treillis à mailles soudées, géotextile, etc.) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dimensions des inclusions : | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | Aire des inclusions (section transversale) : | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | mm2 | | |
| Nombre de lits d’inclusions : | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | ° | | | | | Longueur maximale : | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | mm | | |
| Biais des inclusions (β) : | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | ° | | | | | Espacement vertical des inclusions : | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | mm | | |
| Espacement horizontal des inclusions : | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | mm | | | | | fy : | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | MPa | | |
| Coefficient tenant compte du ratio de renforcement (Rc) : | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Remblai** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poids volumique du remblai en arrière du mur :       kN/m3 | | | | | | | | | | | | | | | Angle de frottement interne du remblai en arrière du mur :       ° | | | | | | | | | | | | | | | | | | | | | | | | | | | | Angle de frottement interne du sol sous les fondations :       ° | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Coefficients de poussée active du sol** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Méthode de calcul utilisée : | | | | | | | | | | | | | | | Stabilité externe : Ka = | | | | | | | | | | | | | | | | | | | | | | | | | | | | Stabilité interne : Ka = | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | Kae = | | | | | | | | | | | | | | | | | | | | | | | (sismique) | | | | | Kae = | | | | | | | | | | | | | | | | | | | | | (sismique) | | | | |
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| **Charges horizontales considérées** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poussée latérale des sols : | | | | | | | | | | kN/m | | | | | Poussée due à la charge de compaction : | | | | | | | | | | | | | | | | | | | | | | | | | | | | Surcharge routière :       kPa | | | | | | | | | | | | | | | | | | | | | | | | | |
| Appliquée à H/3 : | | | | | | | | | | | | | | |  | | | | | | | | kN/m | | | | | | | | | | | | | | | | | | | | Poussée due à la surcharge routière : | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Force due au séisme** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Méthode utilisée (M-O ou autre) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poussée des sols due au séisme (Pae suppl. = Pae - Pa) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | kN/m | | | | | | | | | | | | | appliquée à 0,6 H : | | | | | | | | | | | | | | | | | | | | | | | | | |
| AHM (PGA) : | | | | | | | | F (AHM) : | | | | | | | | | | | | | | | | | | | | | | | | | | Coefficient d’accélération sismique horizontale : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Kh |
| Force d’inertie du mur (Pir) : | | | | | | | | | | | | | | | | kN/m | | | | | | | | | | | | | | | | | | | | | | | | | | | | appliquée à : | | | | | | | | | | | | | | | | | | | | | | | | |
| Combinaison Pae et Pir comme présenté à la section 4.4.1 du *Manuel de conception des structures* : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 Pae + 0,5 Pir | | | | | | | | | | | | | | | | 0,5 Pae + 1 Pir, où 0,5 Pae ≥ poussée active (Pa) pondérée par 1,25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Autres** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Forces dues à l’impact d’un véhicule sur une glissière installée sur le mur (niveau d’essai de la glissière : TL-1, TL-2, TL-4 et TL-5) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Si oui, indiquez le niveau d’essai de la glissière : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Charges verticales considérées** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poids propre du mur : | | | | | | | | | | | |  | | | | | | | | kN/m | | | | | | | | | | | Poids du remblai : | | | | | | | | | | | | | |  | | | | | | | | kN/m | | | | | | | | | | | | | | | |
| Poids du remblai renforcé (mur TSM) : | | | | | | | | | | | |  | | | | | | | | kN/m | | | | | | | | | | | Surcharge routière : | | | | | | | | | | | | | |  | | | | | | | | kN/m | | | | | | | | | | | | | | | |
| Poids dû à la glissière : | | | | | | | | | | | |  | | | | | | | | kN/m | | | | | | | | | | | Autre : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Autre : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Autre : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Combinaisons de charges (états limites considérés) selon le chapitre 3 de la norme CAN/CSA-S6** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Coefficients de tenue géotechnique (φ)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Glissement sur la base : | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | (séisme) | | | |
| Renversement : | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | (séisme) | | | |
| Poinçonnement : | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | (séisme) | | | |
| Arrachement des inclusions : | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | (séisme) | | | |
| Tension des inclusions et des correcteurs : | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | (séisme) | | | |
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| **Stabilité externe** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Renversement : | | | | | | | | |  | | | | | | | | | < 1 | | | | | | | | | | | | | Glissement : | | | | | | | | | | |  | | | | | | | | | | < 1 | | | | | | | | | | | | | | | | |
| Limite d’excentricité (emax) : | | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | Excentricité : | | | | | | | | | | |  | | | | | | | | | | < emax | | | | | | | | | | | | | | | | |
| Poinçonnement (capacité du sol) : | | | | | | | | |  | | | | | | | | | < 1 | | | | | | | | | | | | | Tassement du mur : | | | | | | | | | | |  | | | | | | | mm | | | | | | | | | | | | | | | | | | | |
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| **Stabilité interne (mur TSM)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arrachement des inclusions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Facteur de coefficient de friction des inclusions (F\*) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Facteur d’échelle (α) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Facteur géométrique de renforcement (c) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tension maximale dans les inclusions et les connecteurs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perte de matériau due à la corrosion pour l’inclusion : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perte de matériau due à la corrosion pour le connecteur : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aire effective des inclusions et des connecteurs considérée : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | mm2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Stabilité de la paroi du mur (pour un mur avec paroi en blocs de béton imbriqués)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Glissement interbloc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Renversement du haut du mur | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Durabilité en tenant compte de la corrosion des pièces métalliques** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Conception structurale de la paroi du mur** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Résistance en compression du béton f’c : | | | | | | | | | | | | | | | | | | | | | | MPa | | | | | | | | | Armature fy : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MPa | | | | | |
| Aire d’armature As : | | | | | | | | | | | | | | | | | | | | | | mm2/m | | | | | | | | | Épaisseur de l’enrobage : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | mm | | | | | |
| Dimensions du panneau du mur | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Largeur : | | | | | | mm | | | | | | | | | | Hauteur : | | | | | | | | | | | | | | | mm | | | | | | | | | | | | | Épaisseur : | | | | | | | | | | | | | mm | | | | | | | | | | | |
| Flexion | | | | | | | | | | | | | | | | Cisaillement | | | | | | | | | | | | | | | | | | | | | | | | | | | | Cisaillement + flexion | | | | | | | | | | | | | | | | | | | | | | | | |
| Armature minimale | | | | | | | | | | | | | | | | Armature maximale | | | | | | | | | | | | | | | | | | | | | | | | | | | | Résistance de l’ancrage | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Conception de la semelle** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Vérification de la résistance lors de la manutention des éléments préfabriqués** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Épaisseur des pièces métalliques (autres que l’armature) dans le béton :** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **mm** | | | | | | | | | | | | | | | | | |
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|  |  |  | **Signatures** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Nom en caractères d’imprimerie | | | | | | | | | | | | | | | | | | |  | | | | | | | Signature de la conceptrice ou du concepteur | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | Date (année-mois-jour) | | | | | | | | | |
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| Nom en caractères d’imprimerie | | | | | | | | | | | | | | | | | | |  | | | | | | | Signature de la vérificatrice ou du vérificateur | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | Date (année-mois-jour) | | | | | | | | | |
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