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|  |  |  | |  |  | | **RECOMMANDATIONS** | | | | | | | | | | | | | | | |  | | | |  | | |  | | |  | | | |  |
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| * Les réponses sont rédigées à l’encre (pas de rouge) et au crayon de papier pour les croquis et les schémas. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| * Le sujet devra être rendu avec toutes les pages dans le bon ordre, agrafé dans une copie d’examen. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| * En cas d’utilisation de tableaux de calcul fournis par le centre, ceux-ci seront agrafés sur ce document. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  |  |  | | **Aucun document personnel n’est autorisé.** | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |  | | | |  |
|  |  |  | | **Les calculatrices sont interdites. L’utilisation de la calculatrice de l’ordinateur est autorisée ainsi que l’utilisation des logiciels professionnels.** | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |  | | | |  |
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| Ce dossier est accompagné de documents ressources **(RESi)**, de documents techniques **(DTi)** et documents réponses **(DRi)** numériques listés ci-dessous. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **NUMÉRO** | | | **TITRE** | | | | | | | | | | | | | | | | Pdf_by_mimooh.svg-56a9d1943df78cf772aaca04.jpg | | 51922.png | | | Covadis-logo.jpg | | | | text-file-icon-vector-illustration-78702391.jpg | | | excel.png | | | | | Microsoft-Word-2013-icon.png | |
|  | | | **DOCUMENTS RESSOURCES** | | | | | | | | | | | | | | | |  | |  | | |  | | | |  | | |  | | | | |  | |
| **RES0i** | | | Formulaire | | | | | | | | | | | | | | | | **X** | |  | | |  | | | |  | | |  | | | | |  | |
|  | | | **DOCUMENTS TECHNIQUES** | | | | | | | | | | | | | | | |  | |  | | |  | | | |  | | |  | | | | |  | |
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|  | | | **DOCUMENTS RÉPONSES** | | | | | | | | | | | | | | | |  | |  | | |  | | | |  | | |  | | | | |  | |
| **DR5i** | | | Calcul G0 Stations | | | | | | | | | | | | | | | |  | |  | | | **X** | | | | **X** | | |  | | | | |  | |
| **DR6i** | | | Calcul Points Rayonnés | | | | | | | | | | | | | | | |  | |  | | | **X** | | | | **X** | | |  | | | | |  | |
| **DR9i** | | | Lot 31 – Coordonnées – Contrôle implantation | | | | | | | | | | | | | | | |  | |  | | | **X** | | | | **X** | | |  | | | | |  | |
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| Plusieurs **documents réponses numériques** doivent être rendus pour cette épreuve **U23**. Lorsque cela vous sera demandé dans le sujet, vous devrez **créer un dossier** par étude pour y enregistrer tous les **documents réponses** qui y sont rattachés. Les noms du dossier et des documents réponses seront formatés comme indiqués ci-dessous. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Une image contenant texte  Description générée automatiquement | | | |  | Création des Dossiers Réponses | | | | | | | | | | | |  |  | Enregistrement des Documents Réponses | | | | | | | | | | | | | | | |  | |  |
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|  | Unité | | |  | Étude | | |  | Candidat | | | |  |  | Doc. Rép. | | | |  | | Candidat | | | | | | | | |  | | |  |
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**LISTE DES DOCUMENTS NUMÉRIQUES À RENDRE**

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| **ÉTUDE 4** | **ÉTUDE 5** |
| **🞏 DR5i\_N°CANDIDAT** (seulement si le traitement a été numérique)  **🞏 DR6i\_N°CANDIDAT**  **🞏 DR7i\_N°CANDIDAT** (seulement si le traitement a été numérique) | **🞏 DR8i\_N°CANDIDAT**  **🞏 DR9i\_N°CANDIDAT** |

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| **BACCALAURÉAT PROFESSIONNEL**  **TECHNICIEN GÉOMÈTRE TOPOGRAPHE** | | | | | | | | | | | | | | | | | | | | | |
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| **ÉPREUVE E2** | | | | | | **ANALYSE ET TECHNOLOGIE** | | | | | | | | | | | | | | | |
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| **SOUS – ÉPREUVE**  **U23** | | | | | | **TRAITEMENT NUMÉRIQUE DE DONNÉES** | | | | | | | | | | | | | | | |
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| Ce dossier est composé de documents études **(DE)**, de documents techniques **(DT)** et de documents réponses **(DR)**. | | | | | | | | | | | | | | | | | | | | | |
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| **DOSSIER ÉTUDES** | | | | | | | | | | | | | | | | | | | | | |
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| **Numéro**  **de l’étude** | | | **Activités et documents** | | | | | | | | | | | **Barème** | | | | **Durée conseillée** | | | |
| **0** | | | Lecture du dossier | | | | | | | | | | |  | |  | | 15 | | mn | |
| **1** | | | Calculs de mise en évidence des erreurs systématiques de l’instrument | | | | | | | | | | |  | | / 07 | | 35 | | mn | |
| **2** | | | Identification des données nécessaires pour réduire des distances au système de projection. | | | | | | | | | | |  | | / 07 | | 40 | | mn | |
| **3** | | | Contrôle de stabilité entre deux points du réseau altimétrique en utilisant la méthode de CHOLESKY. | | | | | | | | | | |  | | / 08 | | 50 | | mn | |
| **4** | | | Calcul de G0 de Stations et Points Rayonnés – Vérification | | | | | | | | | | |  | | / 08 | | 50 | | mn | |
| **5** | | | Étude du lot 31 – Implantation de Bâtiment | | | | | | | | | | |  | | / 10 | | 50 | | mn | |
|  | | | **Total** | | | | | | | | | | |  | | **/ 40** | |  | |  | |

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| **TRAITEMENT NUMÉRIQUE DE DONNÉES** | | | | | | | | | | | | | | | | | | **ÉTUDE 1** | | | | |
| **Effectuer les calculs de mise en évidence des erreurs systématiques de l’instrument** | | | | | | | | | | | | | | | | | | | | | | |
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| **SITUATION PROFESSIONNELLE : Cabinet de Géomètre Expert** | | | | | | | | | | | | | | | | | | | | | | |
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| Avant de procéder à l’implantation de nouvelles limites divisoires dans le lotissement, on vous demande de contrôler votre appareil, le TS02 (précisions 5’’). | | | | | | | | | | | | | | | | | | | | | | |
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| Pour cela, vous mettez en station l’instrument et faites des visées en double retournement sur des références éloignées ; puis vous observez une base de contrôle. | | | | | | | | | | | | | | | | | | | | | | |
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| **ON DONNE :** | | | | | | | | | | | | | | | | | | | | | | |
| **DT1** | | | Un carnet de terrain aves les observations (angles horizontaux et verticaux) sur les 2 références - Extrait de la fiche technique du tachéomètre TS02 – Vérification constante de prisme | | | | | | | | | | | | | | | | | |  | |
| **DR1** | | | Document réponse | | | | | | | | | | | | | | | | | |  | |
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| **ON DEMANDE :** | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | **Pour tous les calculs, sur le DR1** | | | | | | | | | | | | | | | | | |  | |
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|  | |  | ⏺ | Énoncer les calculs | | | | | | | | | | | | | | | | |  | |
|  | |  | ⏺ | Énoncer les formules utilisées | | | | | | | | | | | | | | | | |  | |
|  | |  | ⏺ | Faire l’application numérique | | | | | | | | | | | | | | | | |  | |
|  | |  | ⏺ | Mettre en évidence les résultats | | | | | | | | | | | | | | | | |  | |
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| **ON EXIGE :** | | | | | | | | | | | | | | | | | | | | | | |
|  | **•** | | les erreurs sont exprimées en mgon et en mm ; | | | | | | | | | | | | | | | | | |  | |
|  | **•** | | les résultats sont exacts ; | | | | | | | | | | | | | | | | | |  | |
|  | **•**  **•**  **•**  **•** | | l’analyse est correcte ;  les calculs et les formules énoncées ;  les unités sont exprimées. | | | | | | | | | | | | | | | | | | |  |
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**1.1.** Calculer l’erreur systématique de collimation horizontale moyenne d’après les observations des points A et B.

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**1.2.** Calculer l’erreur systématique d’index vertical moyenne d’après les observations des points A et B.

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**1.3.** D’après la fiche technique de l’appareil en DT1, quel est la valeur en mgon de l’écart type sur les angles.

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**1.4.** Calculer la tolérance correspondante aux erreurs angulaires.

La formule de calcul est

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**1.5.** Les erreurs de collimation et d’index calculées en 1.1 et 1.2 sont-elles supérieures à la tolérance ?

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**1.6.** Vos résultats justifient-ils une mise en révision de l’appareil ?

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**1.7.** Compléter le tableau ci-dessous

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| --- | --- | --- | --- | --- |
| **Points visés** | **Angle horizontal en gon** | **Angle horizontal moyen en gon** | **Angle vertical en gon** | **Angle vertical moyen en gon** |
| **A (cercle gauche)** | 25,6589 |  | 102,1456 |  |
| **A (cercle droite)** | 225,6603 |  | 297,8558 |  |
| **B (cercle gauche)** | 114,2589 |  | 98,2547 |  |
| **B (cercle droite)** | 314,2599 |  | 301,7471 |  |

**1.8.** Calculer la constante de prisme entrée par erreur dans l’appareil (erreur systématique) d’après les observations des points C, D et E. Les distances ont été mesurées avec un prisme circulaire dont la constante de prisme est égale à 0 mm.

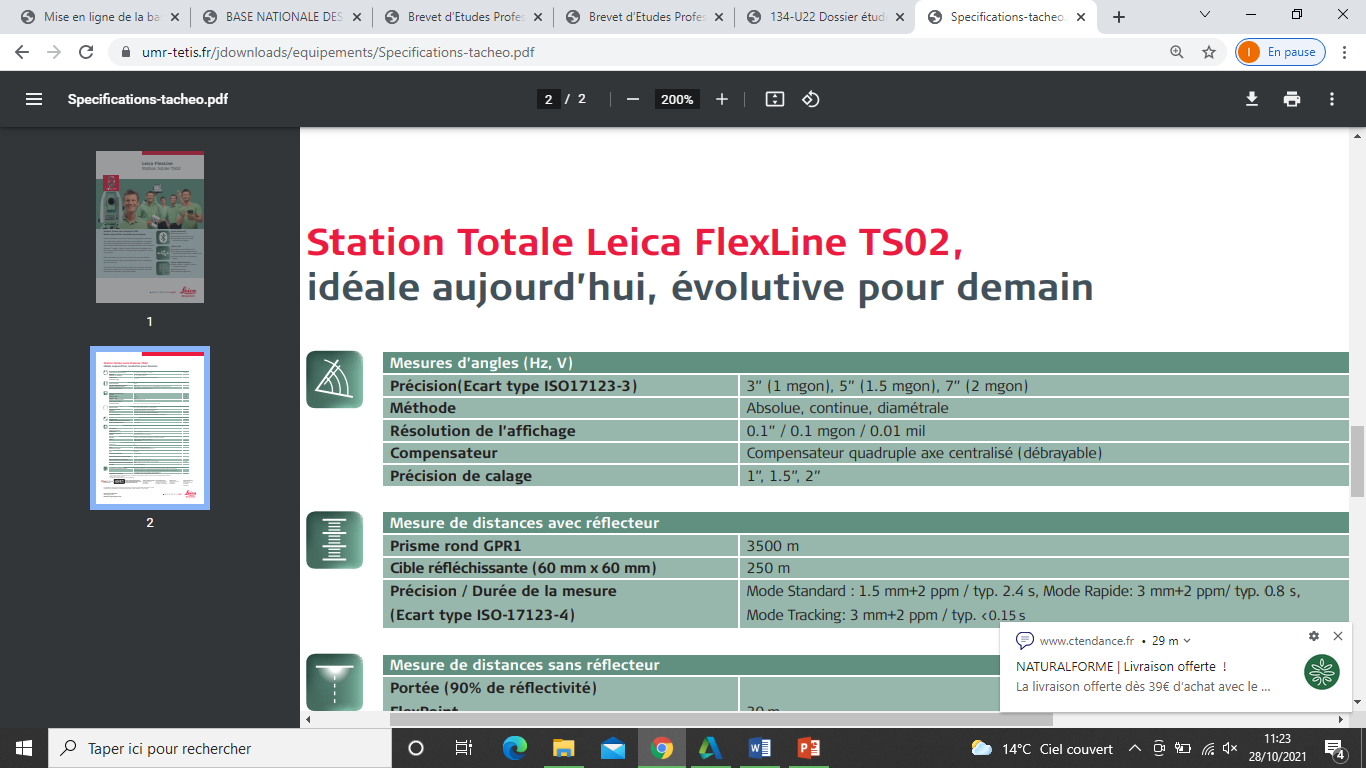
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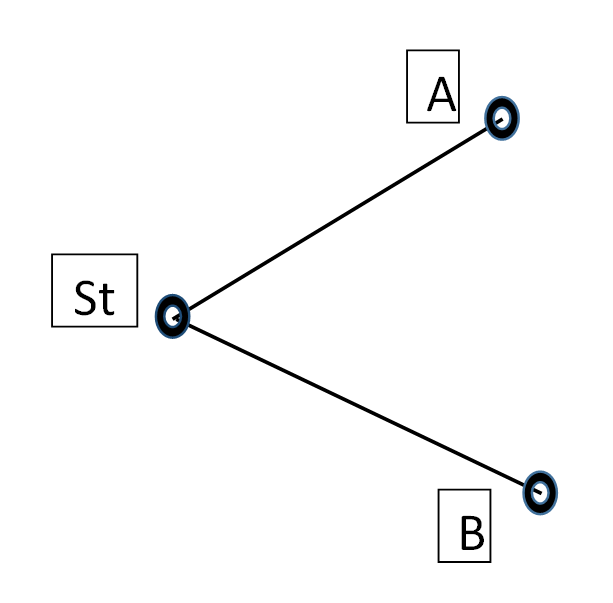
**1.9.** Corriger les longueurs observées de la constante de prisme calculée en 1.8 :

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| --- | --- | --- |
| Observations | Longueurs en m | Distances corrigées |
| C-D | 12,258 |  |
| D-E | 31,252 |  |
| C-E | 43,476 |  |

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**Extrait de la fiche technique du tachéomètre TS02**

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**Carnet de terrain avec les observations**

|  |  |  |
| --- | --- | --- |
| Points visés | Angle horizontal en gon | Angle vertical en gon |
| A | 25,6589 | 102,1456 |
| A | 225,6603 | 297,8558 |
| B | 114,2589 | 98,2547 |
| B | 314,2599 | 301,7471 |

**Vérification constante de prisme**

E

D

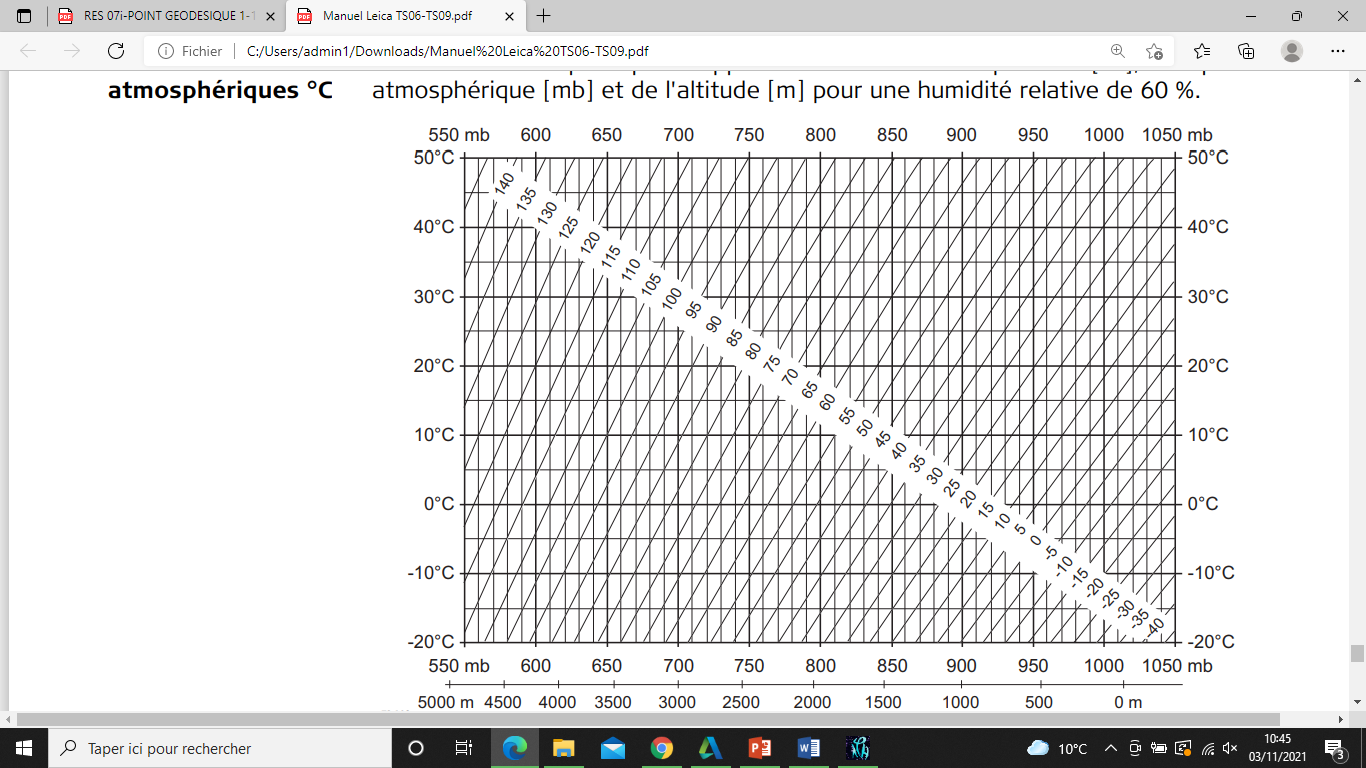
C

|  |  |
| --- | --- |
| Observations | Longueurs en m |
| C-D | 12.258 |
| D-E | 31.252 |
| C-E | 43.476 |

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| **TRAITEMENT NUMÉRIQUE DE DONNÉES** | | | | | | | | | | | | | | | | | | | **ÉTUDE 2** | | | | |
| **Identifier les données nécessaires pour réduire des distances au système de projection** | | | | | | | | | | | | | | | | | | | | | | | |
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| **SITUATION PROFESSIONNELLE : Cabinet de Géomètre Expert** | | | | | | | | | | | | | | | | | | | | | | | |
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| Une équipe de votre cabinet a complété le relevé du lotissement. Vous êtes chargé d’effectuer les calculs et le plan de la partie du lotissement « ABRASSOUS-BAS ». Afin de l’insérer dans le plan existant, vous devez effectuer les calculs dans le système légal actuel en réduisant les distances. | | | | | | | | | | | | | | | | | | | | | | | |
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| **ON DONNE :** | | | | | | | | | | | | | | | | | | | | | | | |
| **DR2** | | | Document réponse | | | | | | | | | | | | | | | | | |  | | |
| **DT2** | | | **Les mesures ont été prises avec un tachéomètre TS02. Le levé a été réalisé à une température de 35 °.**  **L’Altitude moyenne du chantier est de 65m (Hauteur ellipsoïdale = 114 m).**  Schéma de la polygonale | | | | | | | | | | | | | | | | | | | |  |
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| **ON DEMANDE :** | | | | | | | | | | | | | | | | | | | | | | | |
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|  |  | | **Pour tous les calculs, sur le DR2** | | | | | | | | | | | | | | | | | | | |  |
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|  | |  | ⏺ | Énoncer les calculs | | | | | | | | | | | | | | | | | | |  |
|  | |  | ⏺ | Énoncer les formules utilisées | | | | | | | | | | | | | | | | | | |  |
|  | |  | ⏺ | Faire les applications numériques | | | | | | | | | | | | | | | | | | |  |
|  | |  | ⏺ | Mettre en évidence les résultats | | | | | | | | | | | | | | | | | | |  |
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| **ON EXIGE :** | | | | | | | | | | | | | | | | | | | | | | | |
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|  | **•** | | une interpolation précise ; | | | | | | | | | | | | | | | | | | | |  |
|  | **•** | | les résultats sont exacts ; | | | | | | | | | | | | | | | | | | | |  |
|  | **•** | | une rédaction claire. | | | | | | | | | | | | | | | | | | | |  |
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**2.1.** A l’aide de l’abaque ci-dessous, déterminer la correction atmosphérique ca en mm par km (ppm) qu’il aurait fallu saisir au clavier de l’appareil avant de commencer le relever. Pour cela tracer les droites de détermination des ppm.



Ca = …………………………………………..……….ppm

**2.2.** Calculer le coefficient de réduction à l’ellipsoïde (k ellipsoïde), énoncer la formule utilisée et faites l’application numérique. (Pour rappel, le rayon terrestre utilisé est de 6370km).

Formule K ellipsoïde :

**Valeur de K ellipsoïde : ……………………… ppm**

**2.3.** Au point géodésique NARBONNE VIII, dont les coordonnées géographiques (RGF93) sont : Longitude = 2°957412472 et la latitude = 43°184523417, retrouver la valeur de l’altération linéaire en RGF93 CC43 (Kr) à l’aide du logiciel CIRCE.

**Valeur de kr : ……………………………..……… ppm**

**2.4.** Déterminer le module d’échelle (m) permettant de déterminer les distances Lambert à partir des distances horizontales.

**Valeur de m : ……………………………..………**

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**2.5.** Afin de calculer la polygonale fermée, réduire les distances observées en complétant le tableau ci-dessous.

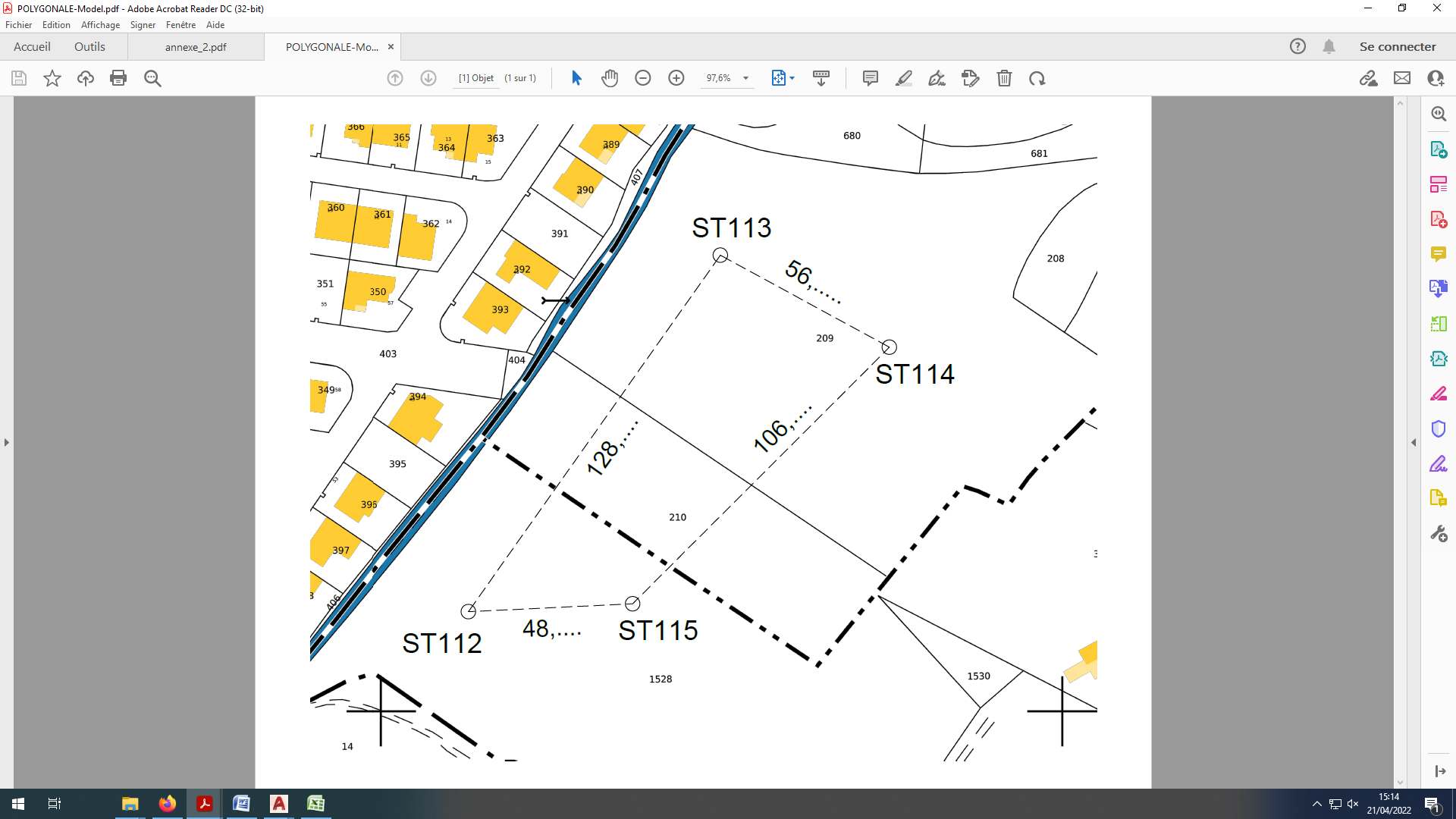
**Formules utilisées**

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| Points | Distances Inclinées  (m) | Angles verticaux  (gon) | Distances horizontales  (m) | Module échelle | distances Lambert  (m) | distances Lambert moyennes  (m) |
| distance 112-113 | **128,260** | 100,2158 | **128,260** |  | **128,248** | **128,246** |
| distance 113-112 | **128,283** | 101,3251 | **128,256** | **128,244** |
| distance 113-114 | **56,531** | 100,4456 | **56,529** | **56,524** | **56,533** |
| distance 114-113 | **56,548** | 99,6845 | **56,547** | **56,542** |
| distance 114-115 | **106,650** | 100,0025 | **106,650** | **106,640** | **106,643** |
| distance 115-114 | **106,656** | 99,9874 | **106,656** | **106,646** |
| distance 115-112 | **48,325** | 101,2586 | **48,315** | **48,311** | **48,318** |
| distance 112-115 | **48,338** | 101,2258 | **48,329** | **48,325** |

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**Schéma de la polygonale**

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| **TRAITEMENT NUMÉRIQUE DE DONNÉES** | | | | | | | | | | | | | | | | | | **ÉTUDE 3** | | | |
| **Effectuer un contrôle de stabilité entre deux points du réseau altimétrique en utilisant la méthode de CHOLESKY** | | | | | | | | | | | | | | | | | | | | | |
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| **SITUATION PROFESSIONNELLE : Cabinet de Géomètre Expert** | | | | | | | | | | | | | | | | | | | | | |
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| Votre cabinet vous charge de contrôler 2 points du réseau altimétrique, situés à proximité du chantier. Afin de gagner du temps, de gagner en précision et de réaliser des contrôles, vous optez pour un nivellement direct CHOLESKY (double point de mire). Vous devrez analyser les résultats obtenus. | | | | | | | | | | | | | | | | | | | | | |
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| **ON DONNE :** | | | | | | | | | | | | | | | | | | | | | |
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| **DT3** | | | Un croquis du cheminement | | | | | | | | | | | | | | | | | |  |
| **DT4** | | | Les fiches signalétiques des 2 repères | | | | | | | | | | | | | | | | | |  |
| **DR3** | | | Document réponse | | | | | | | | | | | | | | | | | |  |
| **DR4** | | | Un carnet de nivellement « CHOLESKY » à compléter | | | | | | | | | | | | | | | | | |  |
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| **ON DEMANDE :** | | | | | | | | | | | | | | | | | | | | | |
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|  |  | | **Pour tous les calculs, sur le DR3** | | | | | | | | | | | | | | | | | |  |
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|  | |  | ⏺ | Énoncer le calcul | | | | | | | | | | | | | | | | |  |
|  | |  | ⏺ | Enoncer la(es) formules utilisées | | | | | | | | | | | | | | | | |  |
|  | |  | ⏺ | Faire l’application numérique | | | | | | | | | | | | | | | | |  |
|  | |  | ⏺ | Mettre en évidence les résultats | | | | | | | | | | | | | | | | |  |
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|  | |  | **Compléter le tableau de nivellement sur le DR4** | | | | | | | | | | | | | | | | |  | |
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| **ON EXIGE :** | | | | | | | | | | | | | | | | | | | | | |
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|  | **•** | | la précision des calculs à +/- 1mm ; | | | | | | | | | | | | | | | | | |  |
|  | **•** | | tous les contrôles sont effectués ; | | | | | | | | | | | | | | | | | |  |
|  | **•** | | les résultats sont exacts ; | | | | | | | | | | | | | | | | | |  |
|  | **•** | | l’analyse est correcte. | | | | | | | | | | | | | | | | | |  |
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**3.1.** A l’aide des fiches signalétiques des 2 repères sur le **DT4**, indiquer l’altitude des 2 repères à contrôler.

Altitude Z'.D.R3S34-I : ………………….m

Altitude Z'.D.R3S34 : ..………………….m

**3.2.** Compléter le tableau de nivellement sur le **DR4**, en faisant apparaitre :

- l’altitudes des repères Z'DR3S3-4-I et Z'DR3S3-4 ;

- les dénivelées individuelles gauches et droites et l’écart.

**3.3.** Calculer la tolérance technique de ce cheminement et la reporter sur le **DR4**.

(avec n = nombre de stations)

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Vérifier la conformité et la dénivelée moyenne sur le **DR4**.

**3.4.** Calculer l’altitude du repère Z'DR3S3-4 sur le **DR4**.

Altitude =

Calculer l’écart entre les deux altitudes du repère Z'DR3S3-4 obtenues sur le **DR4**.

Écart : ……………………………………….mm

**3.5.** Comparer l’écart obtenu en 3.4 avec la tolérance T = ± 30 mm . Faites une conclusion.

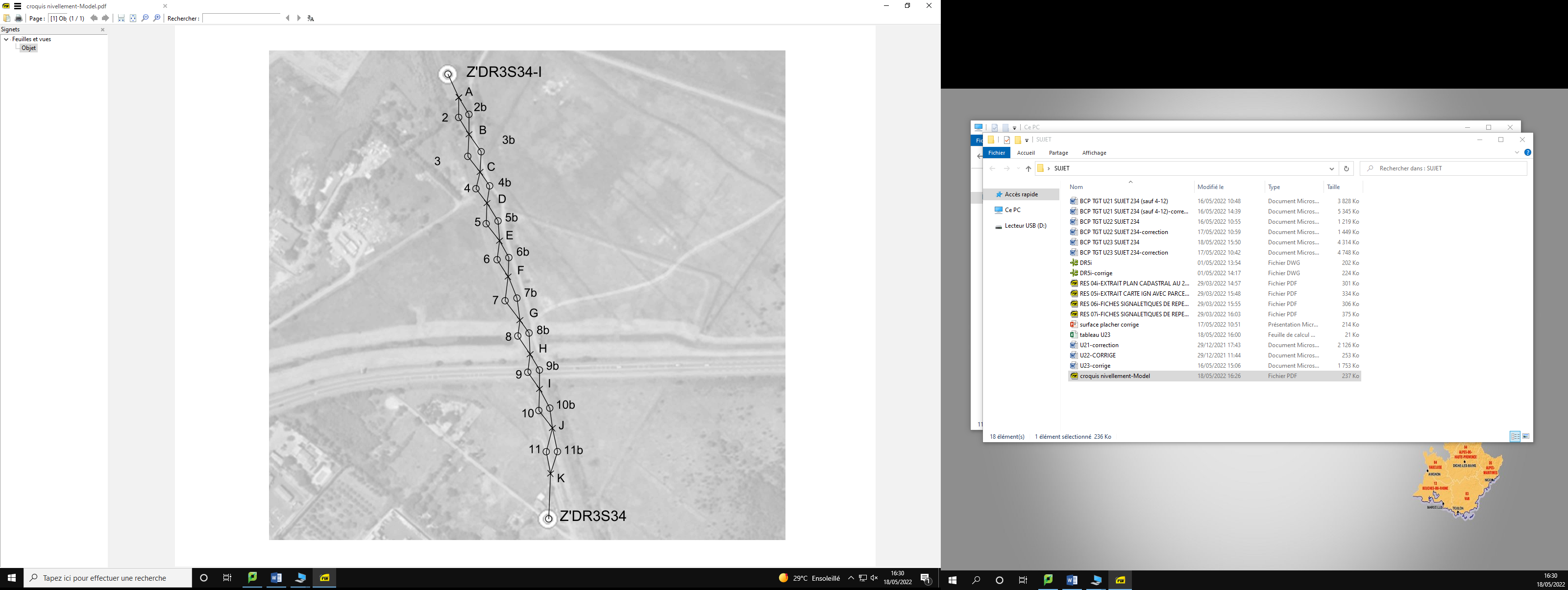
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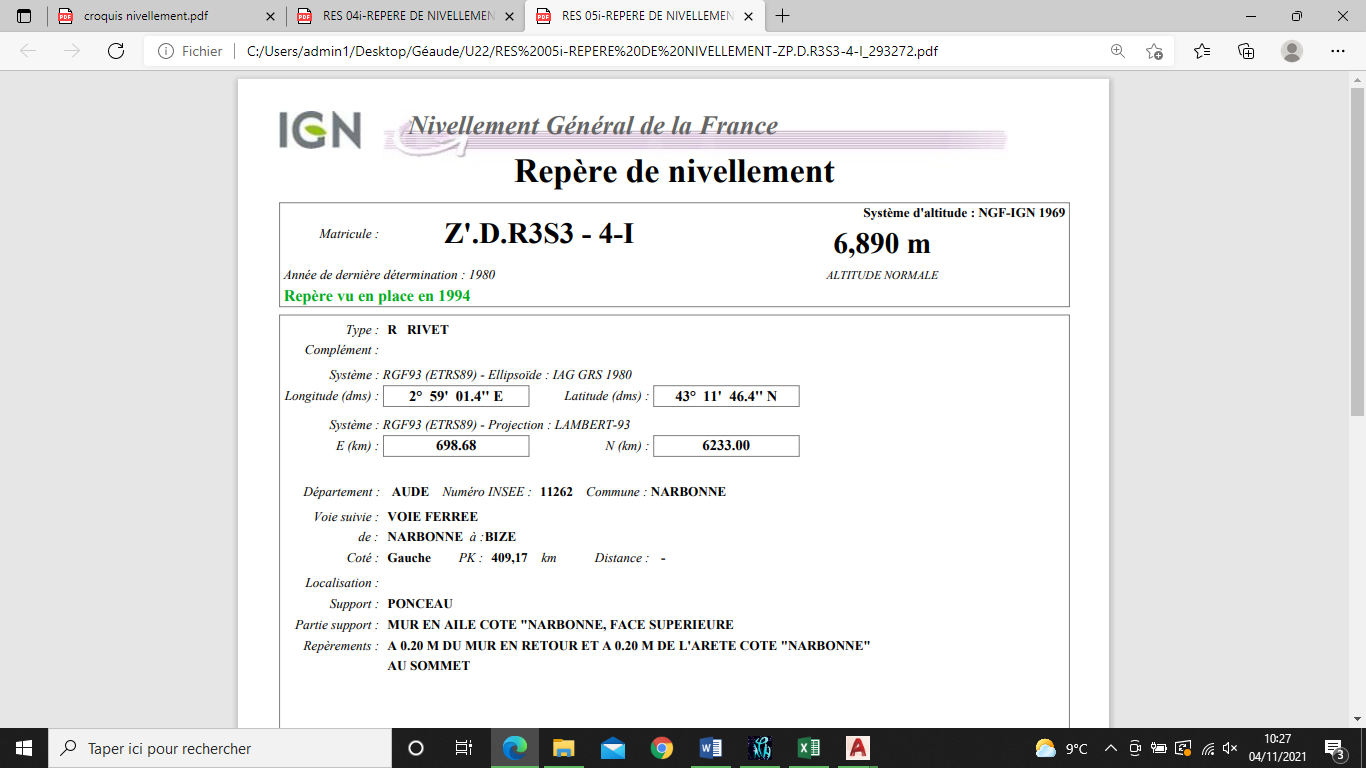
**Carnet de nivellement CHOLESKY**

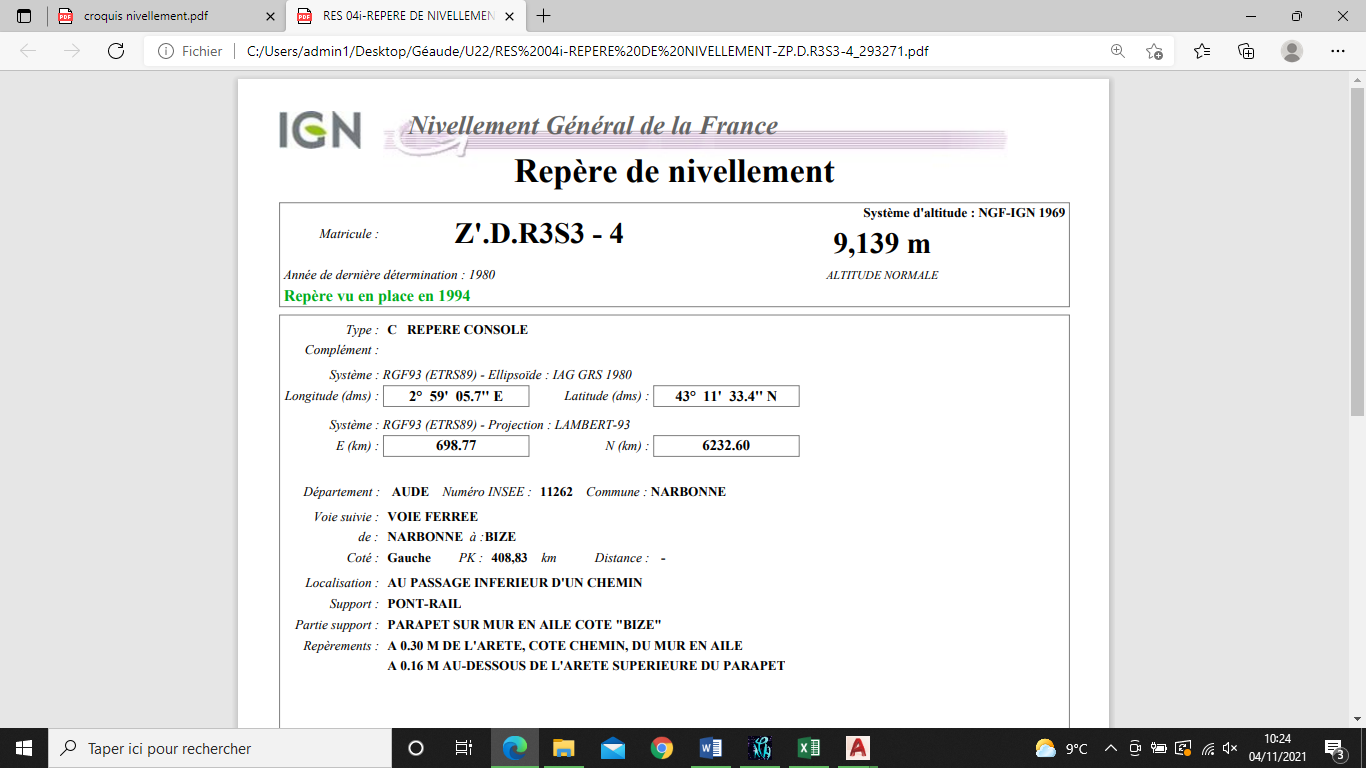
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| Station | points | Lectures arrières | | écart | Lectures avant | | écart | c | Dénivellées  Dénivelées |  | |  |
| gauche | droite | g-d | gauche | droite | g-d |  | gauche | droite | Altitudes | |  |
| A | Z'.D.R3S3-4-I | 1.325 | 1.325 |  |  |  |  |  | 0.080 | 0.077 |  | |  |
| 2-2b |  |  |  | 1.245 | 1.248 | -0.003 | 0.000 |  | |  |
| B | 2-2b | 1.854 | 1.857 | -0.003 |  |  |  | 0.165 | 0.188 |  |
| 3-3b |  |  |  | 1.689 | 1.669 | 0.020 | 0.001 |  |
| C | 3-3b | 0.536 | 0.517 | 0.019 |  |  |  | 0.210 | -0.279 |  |
| 4-4b |  |  |  | 0.326 | 0.796 | -0.470 | -0.002 |  |
| D | 4-4b | 2.001 | 2.469 | -0.468 |  |  |  | 0.122 | 0.610 |  |
| 5-5b |  |  |  | 1.879 | 1.859 | 0.020 | 0.000 |  |
| E | 5-5b | 1.021 | 1.001 | 0.020 |  |  |  | 0.146 | 0.005 |  |
| 6-6b |  |  |  | 0.875 | 0.996 | -0.121 | 0.002 |  |
| F | 6-6b | 2.035 | 2.158 | -0.123 |  |  |  | 0.779 | 1.310 |  |
| 7-7b |  |  |  | 1.256 | 0.848 | 0.408 | -0.001 |  |
| G | 7-7b | 1.996 | 1.587 | 0.409 |  |  |  | 0.543 | 0.393 |  |
| 8-8b |  |  |  | 1.453 | 1.194 | 0.259 | 0.000 |  |
| H | 8-8b | 0.859 | 0.600 | 0.259 |  |  |  | 0.327 | -0.163 |  |
| 9-9b |  |  |  | 0.532 | 0.763 | -0.231 | 0.000 |  |
| I | 9-9b | 1.569 | 1.800 | -0.231 |  |  |  | 0.091 | 0.201 |  |
| 10-10b |  |  |  | 1.478 | 1.599 | -0.121 | 0.001 |  |
| J | 10-10b | 1.889 | 2.011 | -0.122 |  |  |  | 0.224 | 0.476 |  |
| 11-11b |  |  |  | 1.665 | 1.535 | 0.130 | -0.003 |  |
| K | 11-11b | 2.136 | 2.003 | 0.133 |  |  |  | -0.444 | -0.577 |  |
| Z'.D.R3S3-4 |  |  |  | 2.580 | 2.580 | 0.000 |  |  | |  |
|  | Somme LAr gauche |  |  | Somme LAv gauche |  |  |  | Somme | 2.243 | 2.241 |  | |  |
|  |  |  |  | Dénivelée gauche |  |  |  |  | Écart = | | |  |  |
|  |  |  |  |  |  |  |  |  | Tolérance technique = | | |  |  |
|  |  | Somme LAr droite |  |  | Somme LAv droite |  |  |  | Dénivelée moyenne = | | |  | **Altitude calculée Z’.D.R3S3-4** |
|  |  |  |  |  | Dénivelée droite |  |  |  |  |  | | Écart = |  |
|  |  |  |  |  |  |  |  |  |  |  | | Tolérance = 30 mm | **DR4** |

Croquis de cheminement



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| **TRAITEMENT NUMÉRIQUE DE DONNÉES** | | | | | | | | | | | | | | | | | | **ÉTUDE 4** | | | |
| **Calculer les G0 de Stations et Points Rayonnés – Vérification** | | | | | | | | | | | | | | | | | | | | | |
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| **SITUATION PROFESSIONNELLE : Cabinet de Géomètre Expert** | | | | | | | | | | | | | | | | | | | | | |
| Le Cabinet de Géomètre Expert Gérard LAMBERT, chez lequel vous êtes employé vous demande de faire le report de l’emprise du lotissement « Le Clos de la Campane ». | | | | | | | | | | | | | | | | | | | | | |
| Pour ce faire, vous devez : | | | | | | | | | | | | | | | | | | | | | |
|  | | * calculer l’orientation (G0 ou V0) des deux stations qui ont servi au lever ; | | | | | | | | | | | | | | | | | | | |
|  | | * calculer les coordonnées (E,N) des points rayonnés autour des deux stations ; | | | | | | | | | | | | | | | | | | | |
|  | | * contrôler les points doubles. | | | | | | | | | | | | | | | | | | | |
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| **ON DONNE :** | | | | | | | | | | | | | | | | | | | | | |
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| **DT5** | | | Coordonnées RGF93 CC43 des stations et références – Visées d’orientation sur les références | | | | | | | | | | | | | | | | | |  |
| **DT6** | | | Définition de la tolérance pour le calcul des G0 | | | | | | | | | | | | | | | | | |  |
| **DR5** | | | Calcul G0 Stations | | | | | | | | | | | | | | | | | |  |
| **DR5i** | | | Calcul G0 stations (Géobase COVADIS) (fichier TXT) | | | | | | | | | | | | | | | | | |  |
| **DR6i** | | | Calcul Points Rayonnés (Géobase COVADIS) (fichier TXT) | | | | | | | | | | | | | | | | | |  |
| **DR7** | | | Vérification du lever en contrôlant les points doubles | | | | | | | | | | | | | | | | | |  |
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| **ON DEMANDE :** | | | | | | | | | | | | | | | | | | | | | |
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|  | **4.1.** | | Calculer les G0 des stations ST114 et ST115. | | | | | | | | | | | | | | | | | |  |
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|  | **4.2.** | | Calculer les points rayonnés autour des stations ST114 et ST115. | | | | | | | | | | | | | | | | | |  |
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|  | **4.3.** | | Vérifier votre lever en contrôlant les points doubles. | | | | | | | | | | | | | | | | | |  |
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| **ON EXIGE :** | | | | | | | | | | | | | | | | | | | | | |
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|  | **•** | | Tous les G0 (sur chaque visée et moyens pondérés) sont calculés, vérifiés, et recalculés si nécessaire après élimination des visées hors tolérance. | | | | | | | | | | | | | | | | | |  |
|  | **•** | | Les géobases sont complétées si nécessaire et les points rayonnés calculés. | | | | | | | | | | | | | | | | | |  |
|  | **•** | | Les points doubles sont identifiés et vérifiés. | | | | | | | | | | | | | | | | | |  |
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**COORDONNÉES RGF93 CC43 DES STATIONS ET RÉFÉRENCES**

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| **STATION** | | | | **E**  **(m)** | | | | **N**  **(m)** | | | |  |  |  |  |  |  |  |  |
| **ST114** | | | | 1 697 133.797 | | | | 2 221 526.714 | | | |  |  |  |  |  |  |  |  |
| **ST115** | | | | 1 697 036.533 | | | | 2 221 420.657 | | | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **RÉFÉRENCES** | | | | **E**  **(m)** | | | | **N**  **(m)** | | | |  |  |  |  |  |  |  |  |
| **R1013** | | | | 1 696 980.795 | | | | 2 221 856.420 | | | |  |  |  |  |  |  |  |  |
| **R2056** | | | | 1 697 324.489 | | | | 2 221 424.191 | | | |  |  |  |  |  |  |  |  |
| **R3113** | | | | 1 697 180.674 | | | | 2 221 033.865 | | | |  |  |  |  |  |  |  |  |
| **R4201** | | | | 1 696 656.233 | | | | 2 221 554.162 | | | |  |  |  |  |  |  |  |  |

**VISÉES D’OREINTATION SUR LES RÉFÉRENCES**

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| **STATION** | | | **POINT VISÉ** | | | **LECTURE HZ**  **(gon)** | | |  | | | | | |  | | | | | |
| **ST114** | | | **R1013** | | | 329.1599 | | |
|  | | | **R2056** | | | 88.2442 | | |
|  | | | **R3113** | | | 150.7827 | | |
|  | | | **R4201** | | | 260.4746 | | |
| **ST115** | | | **R1013** | | | 136.7357 | | |
|  | | | **R2056** | | | 244.0534 | | |
|  | | | **R3113** | | | 322.1253 | | |
|  | | | **R4201** | | | 66.3276 | | |
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**DÉFINITION DE LA TOLÉRANCE POUR LE CALCUL DES G0**

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| **Exemple d’accès à la fenêtre de configuration avec le logiciel**  **COVADIS :** | | | | | | | |  | | | | | | | | | | | |
| **Outils** |  |  |  |  |  |  |  |
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|  | **Options…** |  |  |  |  |  |  |
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|  |  | **Tol. Poly.** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
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| **Configurer votre logiciel avec les valeurs indiquées ci-contre :** | | | | | | | |
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**4.1. CALCUL DU G0 DE LA STATION ST114 et de la station ST115**

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| --- | --- |
| important-icone-8164-128.png | Cette question pourra être traitée manuellement sur le **DR5** ou numériquement sur le **DR5i** après l’avoir complété.  Dans le cas d’un traitement numérique :   * Créer un dossier **U23\_E4\_N°CANDIDAT**, y enregistrer le fichier **DR5i** au nouveau nom **DR5i\_N°CANDIDAT** après l’avoir traité, * Renseigner les cases grisées du **DR5**. |

**4.1.1.** Configurer votre logiciel de calcul avec les valeurs du **DT6**.

**4.1.2.** Calculer les G0 moyens pondérés des stations ST114 et ST115 avec visées sur les points R1013, R2056, R3113 et R4201.

**4.1.3.** Déterminer les écarts entre chaque G0 et le G0 moyen pondéré de chaque station. Noter si chacun est dans ou hors tolérance (Tolérance : 10 mgon).

**4.1.4.** Si nécessaire, recalculer le G0 moyen pondéré avec les seules visées qui sont dans la tolérance.

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| **STATION** | **POINT VISÉ** | **E (m)** | **N (m)** | **E (m)** | **N (m)** | **G (gon)** | **DH (m)** | **LECT HZ (gon)** | **G0 (gon)** | **G0 x DH** | **ÉCART (gon)** | **TOLÉRANCE** |
| **ST114** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **R1013** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  | **R2056** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  | **R3113** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  | **R4201** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CALCUL 1**  **Avec toutes les visées** | |  | **G0 moy pond =** |  | **gon** | ** DH =** |  | **m** | ** G0 x DH =** |  | **gon x m** |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **CALCUL 2 (si nécessaire)**  **Avec les visées dans la tolérance** | |  | **G0 moy pond =** |  | **gon** | ** DH =** |  | **m** | ** G0 x DH =** |  | **gon x m** |  |
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| **STATION** | **POINT VISÉ** | **E (m)** | **N (m)** | **E (m)** | **N (m)** | **G (gon)** | **DH (m)** | **LECT HZ (gon)** | **G0 (gon)** | **G0 x DH** | **ÉCART (gon)** | **TOLÉRANCE** |
| **ST115** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **R1013** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  | **R2056** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  | **R3113** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  | **R4201** |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CALCUL 1**  **Avec toutes les visées** | |  | **G0 moy pond =** |  | **gon** | ** DH =** |  | **m** | ** G0 x DH =** |  | **gon x m** |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **CALCUL 2 (si nécessaire)**  **Avec les visées dans la tolérance** | |  | **G0 moy pond =** |  | **gon** | ** DH =** |  | **m** | ** G0 x DH =** |  | **gon x m** |  |
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|  | **DR5** |

**4.2. Calcul des points rayonnÉs autour des stations ST114 et ST115**

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| important-icone-8164-128.png | Cette question sera traitée obligatoirement sous forme numérique.  Enregistrer le fichier **DR6i** au nouveau nom **DR6i\_N°CANDIDAT** dans le dossier **U23\_E4\_N°CANDIDAT** après l’avoir traité. |

**4.2.1.** Compléter le **DR6i** en prenant G0(ST114) = 43.1803 gon et G0(ST115) = 255.1654 gon.

**4.2.2.** Calculer les coordonnées (E,N) des points rayonnés autour des stations ST114 et ST115 sur le **DR6i** complété précédemment.

**4.3. VÉrification du lever en contrôlant les points doubles**

|  |  |
| --- | --- |
| important-icone-8164-128.png | Cette question pourra être traitée manuellement sur le **DR7** ou numériquement sur un document **DR7i** à créer.  Dans le cas d’un traitement numérique avec un logiciel de calcul ou tableur :   * créer et enregistrer un nouveau fichier au nom **DR7i\_N°CANDIDAT** dans le dossier **U23\_E4\_N°CANDIDAT ;** * procéder aux calculs et faire apparaitre les écarts entre les points doubles ; * renseigner les cases grisées du **DR7.**   OU dans le cas d’un traitement numérique avec Autocad:   * créer et enregistrer un nouveau fichier au nom **DR7i\_N°CANDIDAT** dans le dossier **U23\_E4\_N°CANDIDAT ;** * insérer le semis de points obtenu à la question 4.2.2. et faire apparaitre les écarts entre les points doubles ; * renseigner les cases grisées du **DR7**. |

**4.3.1.** Déterminer l’écart entre les points doubles rayonnés à partir des stations ST114 et ST115 (Tolérance : 15 mm).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **POINT**  **DOUBLE** | **À PARTIR DE ST114** | | **À PARTIR DE ST115** | | **E (m)** | **N (m)** | **ÉCART**  **(mm)** | **TOLÉRANCE** |
| **E (m)** | **N (m)** | **E (m)** | **N (m)** |
| **P1025** |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
| **P1026** |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
| **P1065** |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
| **P1066** |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON |
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|  | **DR7** |

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| Une image contenant texte  Description générée automatiquement | Avant de rendre votre support numérique, vérifier qu’il contient le dossier et le ou les fichiers suivants (cocher les éléments rendus) :  Dossier : **🞏 U23\_E4\_N°CANDIDAT**,   * Fichier : **🞏 DR5i\_N°CANDIDAT** (seulement si le traitement a été numérique), * Fichier : **🞏 DR6i\_N°CANDIDAT**, * Fichier : **🞏 DR7i\_N°CANDIDAT** (seulement si le traitement a été numérique). |

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| **TRAITEMENT NUMÉRIQUE DE DONNÉES** | | | | | | | | | | | | | | | | | | | **ÉTUDE 5** | | | |
| **Étudier le lot 31 – Implanter le Bâtiment** | | | | | | | | | | | | | | | | | | | | | | |
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| **SITUATION PROFESSIONNELLE : Cabinet de Géomètre Expert** | | | | | | | | | | | | | | | | | | | | | | |
| Le Cabinet de Géomètre Expert Gérard LAMBERT, chez lequel vous êtes employé vous demande d’étudier le lot 31 du lotissement « Le Clos de la Campane ». | | | | | | | | | | | | | | | | | | | | | | |
| Il s’agit de vérifier que | | | | | | | | | | | | | | | | | | | | | | |
|  | | * l’implantation du futur bâtiment est correcte (position et forme) . | | | | | | | | | | | | | | | | | | | | |
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| **ON DONNE :** | | | | | | | | | | | | | | | | | | | | | | |
|  | **DT7** | | | | Lot 31 – Situation – Définition – Coordonnées des sommets | | | | | | | | | | | | | | | | |  |
|  | **DR8 a&b** | | | | Lot 31 – Définition – Raccordement circulaire | | | | | | | | | | | | | | | | |  |
|  | **DR9 a,b &c** | | | | Lot 31 – Coordonnées – Contrôle implantation | | | | | | | | | | | | | | | | |  |
|  | **DR9i** | | | | Lot 31 – Coordonnées – Contrôle implantation (Géobase COVADIS) (fichier TXT) | | | | | | | | | | | | | | | | |  |
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| **ON DEMANDE :** | | | | | | | | | | | | | | | | | | | | | | |
|  | **5.1.** | | Construire et Définir le lot 31. | | | | | | | | | | | | | | | | | | |  |
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|  | **5.2.** | | Définir le raccordement circulaire CDE. | | | | | | | | | | | | | | | | | | |  |
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|  | **5.3.** | | Implanter et contrôler le futur bâtiment. | | | | | | | | | | | | | | | | | | |  |
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| **ON EXIGE :** | | | | | | | | | | | | | | | | | | | | | | |
|  | **•** | | le lot 31 est correctement construit, les prospects et les surfaces sont signalés ; | | | | | | | | | | | | | | | | | | |  |
|  | **•** | | le raccordement circulaire CDE est parfaitement identifié ; | | | | | | | | | | | | | | | | | | |  |
|  | **•** | | les coordonnées de la station libre et des piquets sont correctes dans les deux systèmes ; | | | | | | | | | | | | | | | | | | |  |
|  | **•** | | l’implantation du bâtiment est correcte (position et forme) ; | | | | | | | | | | | | | | | | | | |  |
|  | **•** | | les formules utilisées, les applications numériques et les résultats avec leur unité. | | | | | | | | | | | | | | | | | | |  |
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**LOT 31 – SITUATION – DÉFINITION – COORDONNÉES DES SOMMETS**

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| **LOT 31**  **Lot 31**  **Situation** | | | | | | | | | | | **Coordonnées RGF93 CC43 du lot 31** | | | | | | | | |
| **POINT** | | | **E (m)** | | | **N (m)** | | |
| **A** | | | 1 697 102.076 | | | 2 221 415.796 | | |
| **B** | | | 1 697 112.001 | | | 2 221 431.111 | | |
| **C** | | | 1 697 121.973 | | | 2 221 424.649 | | |
| **D** | | | 1 697 123.536 | | | 2 221 422.380 | | |
| **E** | | | 1 697 123.037 | | | 2 221 419.670 | | |
| **F** | | | 1 697 115.071 | | | 2 221 407.376 | | |
|  |  |  |  |  |  |  |  |  |
| **Prospects** | | | | | | | | |
|  | * Limite séparative de lots :   + 0.00 m sur la limite A-B   + 2.00 m sur la limite A-F | | | | | | | |
|  | * Limite avec voirie : 3.00 m | | | | | | | |
| **Définition – Prospects - Bâtiment** | | | | | | | | | | | **Bâtiment projeté** | | | | | | | | |
|  | * Forme : rectangulaire | | | | | | | |
|  | * Emprise au sol : 12.50 x 8.00 m | | | | | | | |
|  | * Façade BT1-BT2 sur la limite AB | | | | | | | |
|  | * Le piquet BT1 se situe sur la limite AB le plus proche du point A (voir schéma). | | | | | | | |
|  |  |  |  |  |  |  |  |  |
| **Coordonnées locales du lot 31** | | | | | | | | |
| **POINT** | | | **x (m)** | | | **y (m)** | | |
| **A** | | | 971.296 | | | 2004.656 | | |
| **B** | | | 987.535 | | | 2012.983 | | |
| **F** | | | 978.362 | | | 1990.878 | | |
|  |  |  |  |  |  |  |  |  |
| **Lever des piquets à partir de STL** | | | | | | | | |
| **POINT** | | | **Lect Hz (gon)** | | | **Dh (m)** | | |
| **A** | | | 51.5881 | | | 29.080 | | |
| **B** | | | 92.6463 | | | 17.998 | | |
| **F** | | | 15.9521 | | | 23.482 | | |
| **BT1 Levé** | | | 54.3329 | | | 27.488 | | |
| **BT2 Levé** | | | 80.8220 | | | 19.401 | | |
| **BT3 Levé** | | | 62.3263 | | | 12.828 | | |
| **BT4 Levé** | | | 37.1003 | | | 23.318 | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **DT7** | |
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**5.1. CONSTRUIRE ET DÉFINIR LE lot 31**

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| important-icone-8164-128.png | Cette question sera traitée obligatoirement sous forme numérique.  Créer un dossier **U23\_E5\_N°CANDIDAT**, y créer et enregistrer un fichier AutoCAD au nom **DR8i\_N°CANDIDAT**. |

**5.1.1.** Construire le lot 31 sur le **DR8i**. Réaliser les cotes périmétriques du lot.

**5.1.2.** Matérialiser les prospects et la position théorique du bâtiment à construire (piquets BT1 à BT4).

**5.1.3.** Déterminer et faire apparaitre la surface du lot et la surface constructible. Compléter le **DR8a**.

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|  |  |  |  | **Surface du lot :** | | | | | | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |
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|  | **Surface constructible :** | | | | | | | | | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |
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**5.2. DÉfiniR LE raccordement circulaire CDE**

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| important-icone-8164-128.png | Cette question sera traitée obligatoirement sous forme numérique.  Enregistrer les modifications du fichier **DR8i\_N°CANDIDAT** dans le dossier **U23\_E5\_N°CANDIDAT** après l’avoir traité. |

**5.2.1.** Déterminer les valeurs caractéristiques du raccordement circulaire CDE sur le **DR8i**. Les faire apparaitre sur le **DR8i**. Compléter le **DR8b**.

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|  |  | **Coordonnées du centre O :** | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  | **Angle au centre  :** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | **Longueur développée CDE :** | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**5.3. ImplantER et contrÔleR LE futur bÂtiment**

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| important-icone-8164-128.png | Cette question sera traitée obligatoirement sous forme numérique.  Enregistrer le fichier **DR9i** au nouveau nom **DR9i\_N°CANDIDAT** dans le dossier **U23\_E5\_N°CANDIDAT** après l’avoir traité.  Enregistrer les modifications du fichier **DR8i\_N°CANDIDAT** dans le dossier **U23\_E5\_N°CANDIDAT** après l’avoir traité. |

**5.3.1.** Contrôler et compléter la géobase du **DR9i** à partir du **DT7**.

**5.3.2.** Calculer les coordonnées (x,y) dans un système local de la station libre STL par relèvement sur 3 points sur le **DR9i**. Compléter le **DR9a**.

**5.3.3.** Calculer les coordonnées (x,y) dans un système local des piquets BT1 levé à BT4 levé par rayonnement autour de la station libre STL sur le **DR9i**. Compléter le **DR9a**.

**5.3.4.** Insérer le semis de points obtenu aux deux questions précédentes dans votre fichier **DR8i\_N°CANDIDAT**.

**5.3.5.** Transformer par recalage Helmert (échelle=1) les coordonnées locales (x,y) vers les coordonnées CC43 (E,N). Utiliser les points A, B et F comme points de calage connus dans les deux systèmes.

Enregistrer votre travail sur votre fichier **DR8i\_N°CANDIDAT**.

Compléter le **DR9a**.

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|  | **Point** | | | | **x (m)** | | | | | | | | | **y (m)** | | | | | | | | | **E (m)** | | | | | | | | | | | | | | | **N (m)** | | | | | | | | | | | | | | | |  | | |  | |
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|  | **STL** | | | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | |  | |
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|  | **BT1 Levé** | | | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | |  | |
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|  | **BT2 Levé** | | | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | |  | |
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|  | **BT3 Levé** | | | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | |  | |
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|  | **BT4 Levé** | | | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | |  | |
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**5.3.6.** Vérifier que le bâtiment implanté (piquets BT1 - levé à BT4 - levé) se situe dans la zone constructible sur le **DR8i\_N°CANDIDAT**. Compléter le **DR9b**.

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|  | **La position du bâtiment est correcte : 🞏 oui 🞏 non.** | | | | | | | | | | | | | | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**5.3.7.** Vérifier que la forme du bâtiment implanté (piquets BT1 - levé à BT4 - levé) est correcte sur le **DR8i\_N°CANDIDAT** (Tolérance : 15 mm). Compléter le **DR9c**.

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|  | **Distances** | | | | | | | | **Théoriques** | | | | | | | | **Mesurées** | | | | | | | | **Écarts** | | | | | | **Dans la tolérance** | | | | | | | |  |
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|  | **BT1-BT2** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON | | | | | | | |  |
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|  | **BT3-BT4** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON | | | | | | | |  |
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|  | **BT2-BT3** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON | | | | | | | |  |
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|  | **BT4-BT1** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON | | | | | | | |  |
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|  | **BT1-BT3** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON | | | | | | | |  |
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|  | **BT2-BT4** | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 🞏 OUI 🞏 NON | | | | | | | |  |
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|  | **Détermination des diagonales théoriques BT1-BT3 = BT2-BT4 :** | | | | | | | | | | | | | | | | | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |
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|  | **La forme du bâtiment est-elle correcte ? 🞏 oui 🞏 non.** | | | | | | | | | | | | | | | | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Une image contenant texte  Description générée automatiquement | Avant de rendre votre support numérique , vérifier qu’il contient le dossier et les fichiers suivants (cocher les éléments rendus) :  Dossier : **🞏 U23\_E5\_N°CANDIDAT**,   * Fichier : **🞏 DR8i\_N°CANDIDAT**, * Fichier : **🞏 DR9i\_N°CANDIDAT**. |