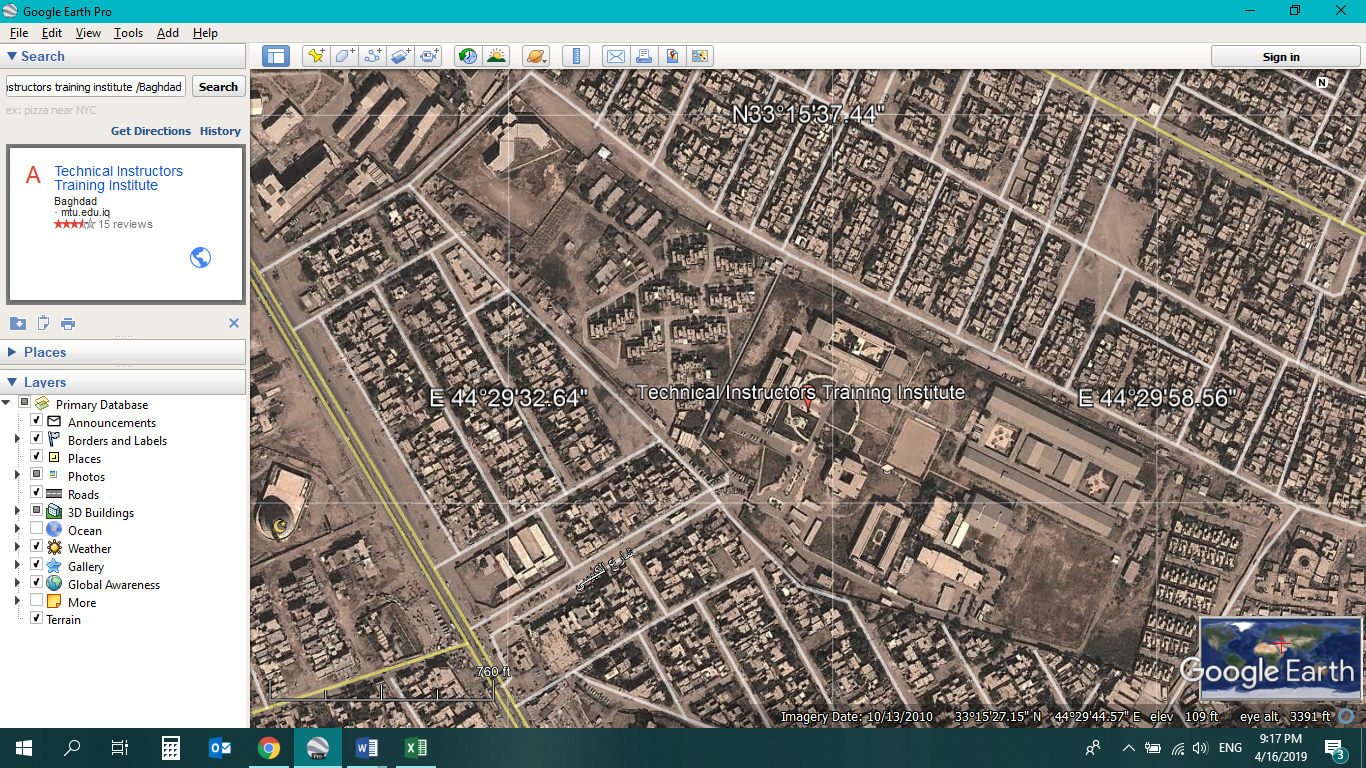
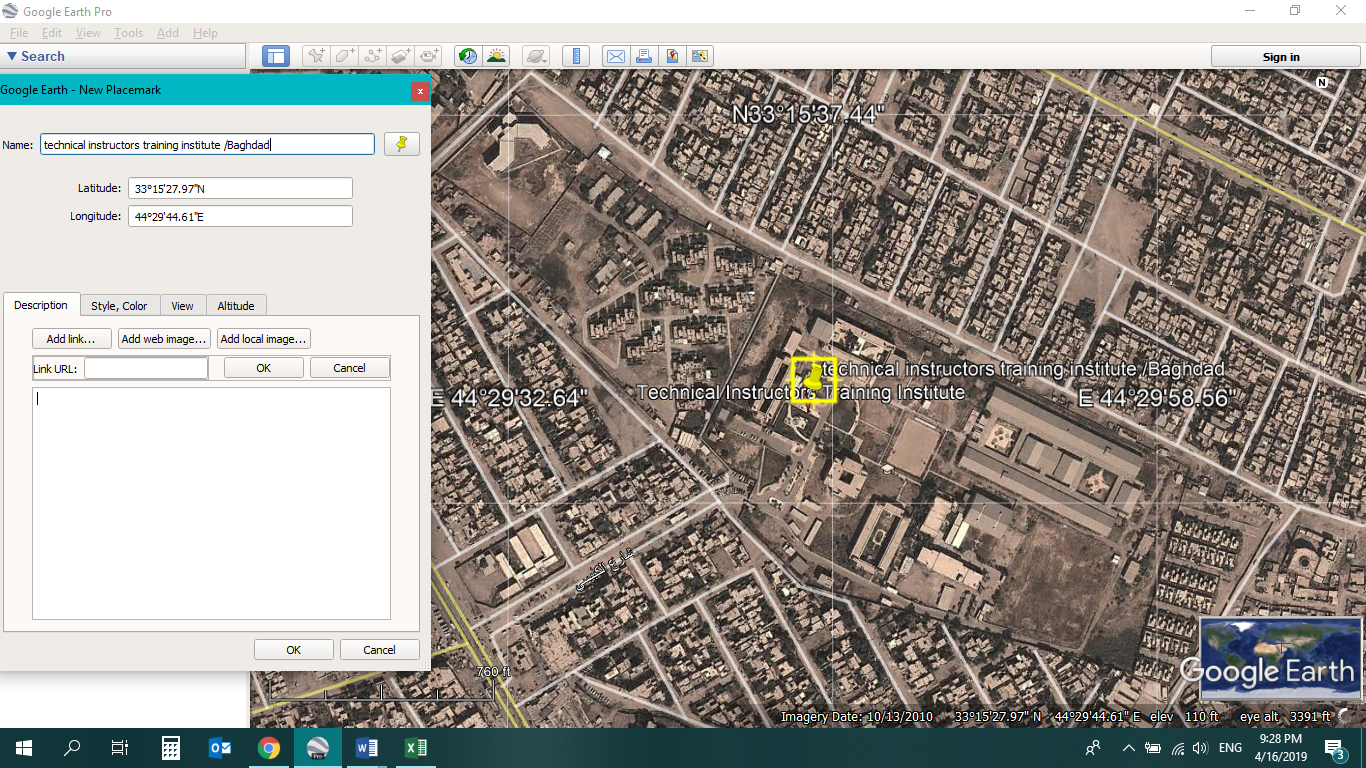
Annex 1:

|  |  |
| --- | --- |
| **Chromium(III) oxide** | |
| [Cr2o3 gruener farbstoff.jpg](https://en.wikipedia.org/wiki/File:Cr2o3_gruener_farbstoff.jpg) | |
| [Corundum struct.png](https://en.wikipedia.org/wiki/File:Corundum_struct.png) | |
| **Names** | |
| Other names  Chromium sesquioxide Chromia Chrome green [Eskolaite](https://en.wikipedia.org/wiki/Eskolaite) | |
| **Identifiers** | |
| [CAS Number](https://en.wikipedia.org/wiki/CAS_Registry_Number) | * [1308-38-9](http://www.commonchemistry.org/ChemicalDetail.aspx?ref=1308-38-9)☑ |
| 3D model ([JSmol](https://en.wikipedia.org/wiki/JSmol" \o "JSmol)) | * [Interactive image](https://chemapps.stolaf.edu/jmol/jmol.php?model=O%3D%5BCr%5DO%5BCr%5D%3DO) |
| [ChEBI](https://en.wikipedia.org/wiki/ChEBI) | * [CHEBI:48242](https://www.ebi.ac.uk/chebi/searchId.do?chebiId=48242)☑ |
| [ChemSpider](https://en.wikipedia.org/wiki/ChemSpider) | * [451305](http://www.chemspider.com/Chemical-Structure.451305.html)☑ |
| [ECHA InfoCard](https://en.wikipedia.org/wiki/ECHA_InfoCard) | [100.013.783](https://echa.europa.eu/substance-information/-/substanceinfo/100.013.783) |
| [PubChem](https://en.wikipedia.org/wiki/PubChem) CID | * [517277](https://pubchem.ncbi.nlm.nih.gov/compound/517277) |
| [RTECS number](https://en.wikipedia.org/wiki/RTECS) | GB6475000 |
| [UNII](https://en.wikipedia.org/wiki/Unique_Ingredient_Identifier) | * [X5Z09SU859](https://fdasis.nlm.nih.gov/srs/srsdirect.jsp?regno=X5Z09SU859)☑ |
| [CompTox Dashboard](https://en.wikipedia.org/wiki/CompTox_Chemicals_Dashboard) (EPA) | * [DTXSID4043721](https://comptox.epa.gov/dashboard/DTXSID4043721) [Edit this at Wikidata](https://www.wikidata.org/wiki/Q407905#P3117) |
| [InChI](https://en.wikipedia.org/wiki/International_Chemical_Identifier)[[show]](https://en.wikipedia.org/wiki/Chromium(III)_oxide) | |
| [SMILES](https://en.wikipedia.org/wiki/Simplified_molecular-input_line-entry_system)[[show]](https://en.wikipedia.org/wiki/Chromium(III)_oxide) | |
| **Properties** | |
| [Chemical formula](https://en.wikipedia.org/wiki/Chemical_formula) | Cr2O3 |
| [Molar mass](https://en.wikipedia.org/wiki/Molar_mass) | 151.9904 g/mol |
| Appearance | light to dark green, fine crystals |
| [Density](https://en.wikipedia.org/wiki/Density) | 5.22 g/cm3 |
| [Melting point](https://en.wikipedia.org/wiki/Melting_point) | 2,435 °C (4,415 °F; 2,708 K) |
| [Boiling point](https://en.wikipedia.org/wiki/Boiling_point) | 4,000 °C (7,230 °F; 4,270 K) |
| [Solubility in water](https://en.wikipedia.org/wiki/Aqueous_solution) | insoluble |
| [Solubility](https://en.wikipedia.org/wiki/Solubility) in [alcohol](https://en.wikipedia.org/wiki/Alcohol) | insoluble in [alcohol](https://en.wikipedia.org/wiki/Alcohol), [acetone](https://en.wikipedia.org/wiki/Acetone), acids |
| [Magnetic susceptibility](https://en.wikipedia.org/wiki/Magnetic_susceptibility) (χ) | +1960.0×10−6 cm3/mol |
| [Refractive index](https://en.wikipedia.org/wiki/Refractive_index)(*n*D) | 2.551 |
| **Structure** | |
| [Crystal structure](https://en.wikipedia.org/wiki/Crystal_structure) | hexagonal |
| **Thermochemistry** | |
| [Std molar entropy](https://en.wikipedia.org/wiki/Standard_molar_entropy) (*S*~~o~~298) | 81 J·mol−1·K−1 |
| [Std enthalpy of formation](https://en.wikipedia.org/wiki/Standard_enthalpy_change_of_formation)(Δf*H*⦵298) | −1128 kJ·mol−1 |
| **Hazards** | |
| [EU classification](https://en.wikipedia.org/wiki/Dangerous_Substances_Directive_(67/548/EEC)" \o "Dangerous Substances Directive (67/548/EEC))(DSD) [*(outdated)*](https://en.wikipedia.org/wiki/CLP_Regulation#Implementation) | Harmful (**Xn**) Dangerous for the environment (**N**) |
| US health exposure limits ([NIOSH](https://en.wikipedia.org/wiki/National_Institute_for_Occupational_Safety_and_Health)): | |
| [PEL](https://en.wikipedia.org/wiki/Permissible_exposure_limit)(Permissible) | TWA 1 mg/m3[[1]](https://en.wikipedia.org/wiki/Chromium(III)_oxide#cite_note-PGCH-1) |
| [REL](https://en.wikipedia.org/wiki/Recommended_exposure_limit)(Recommended) | TWA 0.5 mg/m3[[1]](https://en.wikipedia.org/wiki/Chromium(III)_oxide#cite_note-PGCH-1) |
| [IDLH](https://en.wikipedia.org/wiki/IDLH) (Immediate danger) | 250 mg/m3[[1]](https://en.wikipedia.org/wiki/Chromium(III)_oxide#cite_note-PGCH-1) |
| Except where otherwise noted, data are given for materials in their [standard state](https://en.wikipedia.org/wiki/Standard_state) (at 25 °C [77 °F], 100 kPa). | |

**Annex 3:**

from google earth program we took this picture that give us technical instructors training institute where we work this project

Then we account by google earth the Latitude & Longitude angle then entered in excel sheet 1 and sheet 3 to calculate heat flux long a day from (9:30 AM to 4:00 PM) in that location (technical instructors training institute).



## References:

* 1. NIOSH Pocket Guide to Chemical Hazards. [*"#0141"*](https://www.cdc.gov/niosh/npg/npgd0141.html). [*National Institute for Occupational Safety and Health*](https://en.wikipedia.org/wiki/National_Institute_for_Occupational_Safety_and_Health) (NIOSH).
  2. [*"Eskolaite"*](http://webmineral.com/data/Eskolaite.shtml). Webminerals*. Retrieved 2009-06-06*.
  3. J.E Greedan, (1994), *Magnetic oxides* in Encyclopedia of Inorganic chemistry R. Bruce King, Ed. John Wiley & Sons. [ISBN](https://en.wikipedia.org/wiki/International_Standard_Book_Number) [0-471-93620-0](https://en.wikipedia.org/wiki/Special:BookSources/0-471-93620-0)
  4. A. F. Holleman and E. Wiberg "Inorganic Chemistry" Academic Press, 2001, New York. [ISBN](https://en.wikipedia.org/wiki/International_Standard_Book_Number) [0-12-352651-5](https://en.wikipedia.org/wiki/Special:BookSources/0-12-352651-5).
  5. Eastaugh, Nicholas; Chaplin, Tracey; Siddall, Ruth (2004). The pigment compendium: a dictionary of historical pigments. Butterworth-Heinemann. p. 391. [*ISBN*](https://en.wikipedia.org/wiki/International_Standard_Book_Number) [*0-7506-5749-9*](https://en.wikipedia.org/wiki/Special:BookSources/0-7506-5749-9).
  6. Gerd Anger, Jost Halstenberg, Klaus Hochgeschwender, Christoph Scherhag, Ulrich Korallus, Herbert Knopf, Peter Schmidt, Manfred Ohlinger, "Chromium Compounds" in Ullmann's Encyclopedia of Industrial Chemistry, Wiley-VCH, Weinheim, 2005. [doi](https://en.wikipedia.org/wiki/Digital_object_identifier):[10.1002/14356007.a07\_067](https://doi.org/10.1002%2F14356007.a07_067)

* 1. ["Ammonium dichromate volcano"](http://\"Ammonium dichromate volcano\"). www.rsc.org*. Retrieved 2019-02-26*.
  2. R. Scholder "Sodium Hexahydroxochromate(III)" in Handbook of Preparative Inorganic Chemistry, 2nd Ed. Edited by G. Brauer, Academic Press, 1963, NY. Vol. 2, 1688ff.