Incident Assessment

Incident ID	CIV0656
Location	Saltivka district, Kharkiv
Coordinates	50.0223, 36.3416[1]
Date	01/04/2022 (*prima facie*)
Time	No later than 10:01 EET

Description of the Events

On 01/04/2022, a photograph depicting a remnant identified as likely belonging to a Grad rocket was posted[2] on Facebook by the Interregional Center for Humanitarian Demining and Rapid Response (*"Міжрегіональний центр гуманітарного розмінування та швидкого реагування"*). The munition remnant is embedded in the asphalt and points in the direction of the north.

Key Findings

- No later than 01/04/2022 at 10:01 EET, the motor section of an unidentified type of Grad rocket impacted the road near 38 Heroiv Pratsi Street, in front of the ROST supermarket located in Saltivka, the residential area of Kharkiv, at 50.0223, 36.3416[3].
- The presence of the 200th Separate Motorized Rifle Brigade was reported within the estimated area of the likely rocket motor section origin. It was reported to employ 18 BM-21 Grad Multiple Launch Rocket Systems (MLRS) as of 2019.
- Based on the identified open source materials, it was not possible to establish the date when this incident took place.
- No military assets or troops were reported in the area of impact on 01/04/2022.
- No information concerning casualties among the civilian population or damage to civilian infrastructure that could be linked to the munition remnant was identified in open sources.

[1] https://maps.app.goo.gl/5LTY9t7P6cvYwUx48
[2] https://www.facebook.com/photo?fbid=443136087609746&set=pcb.443136594276362
[3] https://maps.app.goo.gl/5LTY9t7P6cvYwUx48

Description of Searches

Online search for relevant materials was conducted in English, Russian and Ukrainian in the period between 30/03/2022 and 02/04/2022 using the following key words and their combinations: “strikes”, “grad”, “rocket”, “kharkiv”, “rost”, “round building”, “casualties”, “saltivka”, “200th Separate Motorized Rifle Brigade”, “explosions”, “cluster munitions”, “situation in Kharkiv”.

Background Summary of Significant Descriptive Content

Media Reports

- Kharkiv Today[4]: Over 170 artillery strikes using Grad MLRS were reported on 31/03/2022.
- NV.UA[5]: Reported artillery strikes on the thermal power plant on 01/04/2022.
- Suspilne Kharkiv[6]: Reported multiple loud explosions in Kharkiv on 31/04/2022.
- Kharkiv Life[7]: Reported loud explosions in Kharkiv on 31/04/2022.

NGO Reports

None identified.

Other

None identified.

[4] https://2day.kh.ua/ru/kharkow/37-y-den-voyny-170-obstrelov-iz-gradov-evakuaciya-i-raketnyy-udar-po-centru-kharkova

[5] https://nv.ua/kharkiv/harkov-obstrely-rossiyane-obstrelyali-turboatom-i-hemz-novosti-harkova-50230353.html

[6] https://t.me/suspilnekharkiv/10519

[7] https://t.me/kharkivlife/32935

Analysis of Examinable Content

SOURCE	DATE/ TIME	CAPTION	DESCRIPTION	VISUAL CONTENT / COORDINATES
Source 1 Image 1 (S1I1[8])	01/04/2022 10:01 EET	**Original:** "Лише так, викладаючись на повну, ми переможемо, все буде Україна! Пам'ятайте про безпеку та довірте справу по з'ясуванню боєздатності ВНП фахівцям. Головне, не панікуйте! #ICHDRR #МЦГРШР #ДСНС #UAРАЗОМ #stoprussia" **Translation:** "Only so, studying to the fullest, we will win, everything will be Ukraine! Keep in mind security and entrust the case of finding the capability of GNP to specialists. The main thing is, don't panic! #ICHDRR #МЦГРШР #ДСНС #UAРАЗОМ #stoprussia"	At what appears to be a commercial area of a residential district, a man wearing protective gear with a Ukrainian flag on the flap pocket and a "Розмінування" (Mine Clearance) label on the vest is depicted with a metal hourglass-shaped object in his hands, squatting near a metal pipe embedded in the asphalt at an acute angle towards the north-northeast direction. Several residential and commercial buildings are visible in the background.	 *50.0223, 36.3416*

Questions to Investigate

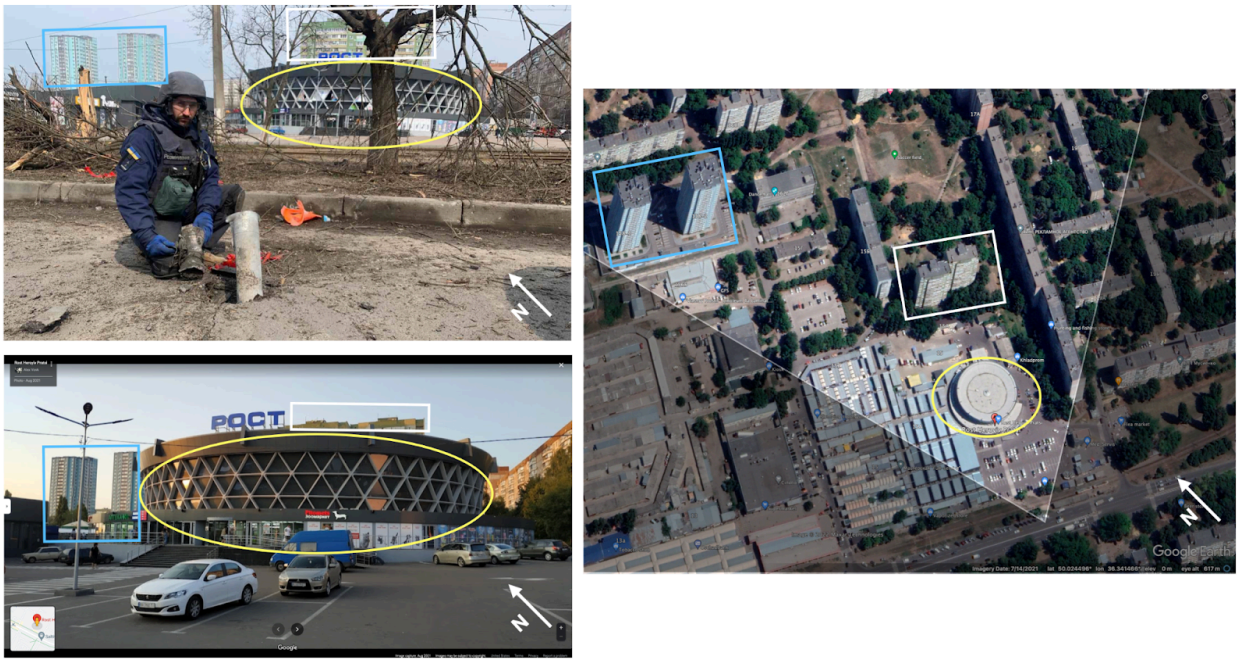
Where Was the Incident?

The location of the remnant embedded in the asphalt was identified as being near 38 Heroiv Pratsi St., located in Saltovka, a residential district on the north side of Kharkiv, Ukraine, at 50.0223, 36.3416[9].

The location of the remnant depicted in S1I1 was established by identifying the round building with a "POCT" sign on its top and its possible use. After the building was identified and geolocated, its coordinates were confirmed by comparing the layouts of it and other residential buildings on S1I1 with those on publicly available imagery.

[8] https://www.facebook.com/photo?fbid=443136087609746&set=pcb.443136594276362
[9] https://maps.app.goo.gl/5LTY9t7P6cvYwUx48

An online search of the "РОСТ" sign identified that the round building is part of the Kharkiv-wide chain of supermarkets[10]. The round building was geolocated by conducting an online search in Russian using the combination of the following keywords: "*РОСТ магазин круглое здание Украина*" ("*ROST shop round building Ukraine*").



Top left: ROST supermarket (Yellow Ellipse) and layout of residential buildings (Blue and White Rectangles) depicted by S1I1. Bottom left: Google Street View depicting the same features dated August 2021 (Credit: Google). Right: Satellite imagery depicting the same features dated 14/07/2021 (Credit: Maxar Technologies/Google Earth Pro).

When Was the Incident?

From at least 29/03/2022 up until 01/04/2022 Saltivka district of Kharkiv was under daily shelling, and as such it is not possible to establish the earliest possible date for CIV0656 based on the identified imagery. However, the CIV0656 incident could not have taken place later than 10:01 EET on 01/04/2022, the date and time when S1I1, the photo depicting the CIV0656 scene, was posted on Facebook.

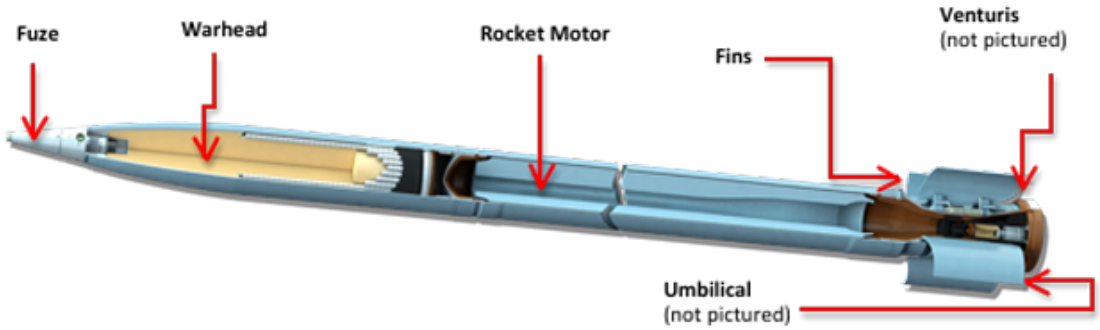
What Kind of Munition Was Used?

Based on the size, shape, colour, and nature of deformation of the rocket's remnant after its detonation that was depicted by S1I1, the munition used in the strike was identified as likely belonging to an unidentified type of 122 mm Grad rocket.

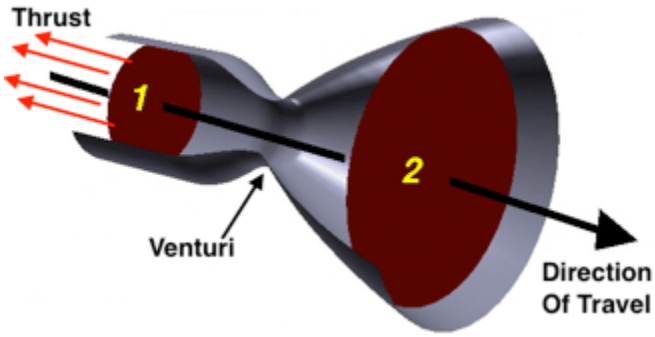
[10] http://rost.kharkov.ua/company/o-nas/

Google and Yandex search engines were used to look for images of the Grad rocket remains online. Several images were found that were very similar to the ones shown at the CIV0656 scene in S1I1. Notably, the remnants were large, grey in colour, and had a typical torn-like deformation after the explosion at the point where their elements were connected to each other.

On S1I1 a member of a demining team is depicted holding part of the rocket's nozzle called a "venturi". It looks like an hourglass and is very similar to the rocket recognition reference imagery. Hence, the piece of munition depicted on S1I1 probably came from one of the Grad rocket modifications, and further indicates the use of Grads. According to open source information, 9M22U appears to be the most common type of Grad rockets that are launched using the BM-21 Grad MLRS; it weighs 66 kg and is equipped with 6.4 kg of explosives in the warhead[11]. Other 122 mm rockets compatible with Grad systems range from 1.5 m to 3.3 m in length and from 27 kg to 71.6 kg in weight. However, smaller rockets are generally used with portable systems, rather than full MLRSs, and the majority of commonly used rockets are 2.5-3 m and 65-70 kg.[12]

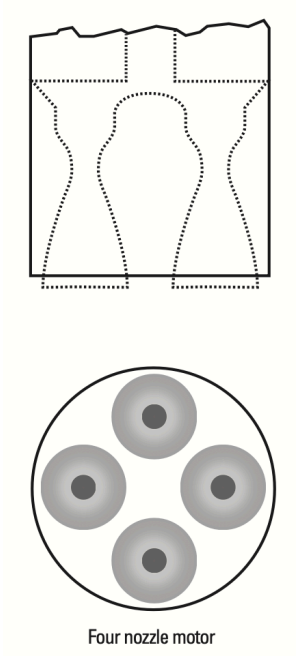


The principal components of a 122 mm Grad rocket[13] for the BM-21 MLRS. (Credit: Federal State Unitary Enterprise (Splav) State Research and Production).



The diagram[14] showing a rocket venturi (Credit: Glenn Research Center, NASA).

[11] https://thebulletin.org/2022/09/a-ukrainian-expert-assesses-the-possible-impact-of-a-military-attack-on-the-zaporizhzhia-nuclear-power-plant/
[12] https://aoav.org.uk/2021/what-is-a-grad/
[13] http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/
[14] http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/



Construction of a nozzle motor (venturi) of Grad rockets and side and back view on the four nozzle motor (venturis) of rocket (Credit [GICHD](#)[15]; Markus Schiller for [IISS](#)[16]).

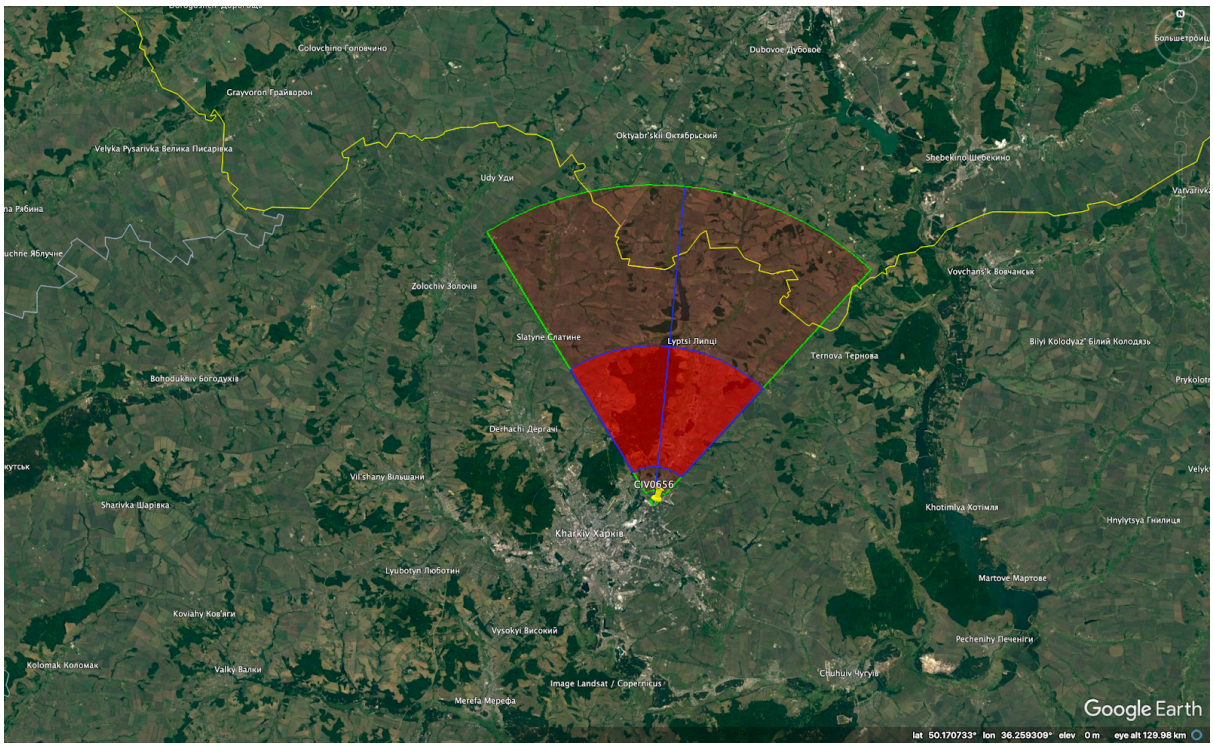
Comparison of the rocket motor section (Blue Rectangle) and what appears to be a venturi (Green Ellipse) depicted by S1I1 (Top Centre) with imagery of the Grad 9M22U rocket's body (Credit: [Calibra Obscura](#)[17]; CAT UXO).

[15] http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/
[16] https://www.iiss.org/blogs/research-paper/2022/04/missile-identification-and-assessment
[17] https://www.calibreobscura.com/the-weaponry-of-is-west-africa-pt-5-curious-capabilities/

Since 2014, the Human Rights Watch has reported that Grad rockets have been used by both Ukrainian armed forces and Russian-sponsored non-state actors.[18] A Grad rocket is a Russian 122 mm unguided rocket, a high-explosive fragmentation, electrically initiated, surface-to-surface, fin, and spin-stabilised rocket launched from the BM-21 Grad truck-mounted MLRS.[19]

Is There Any Evidence of the Direction the Munition Came from?

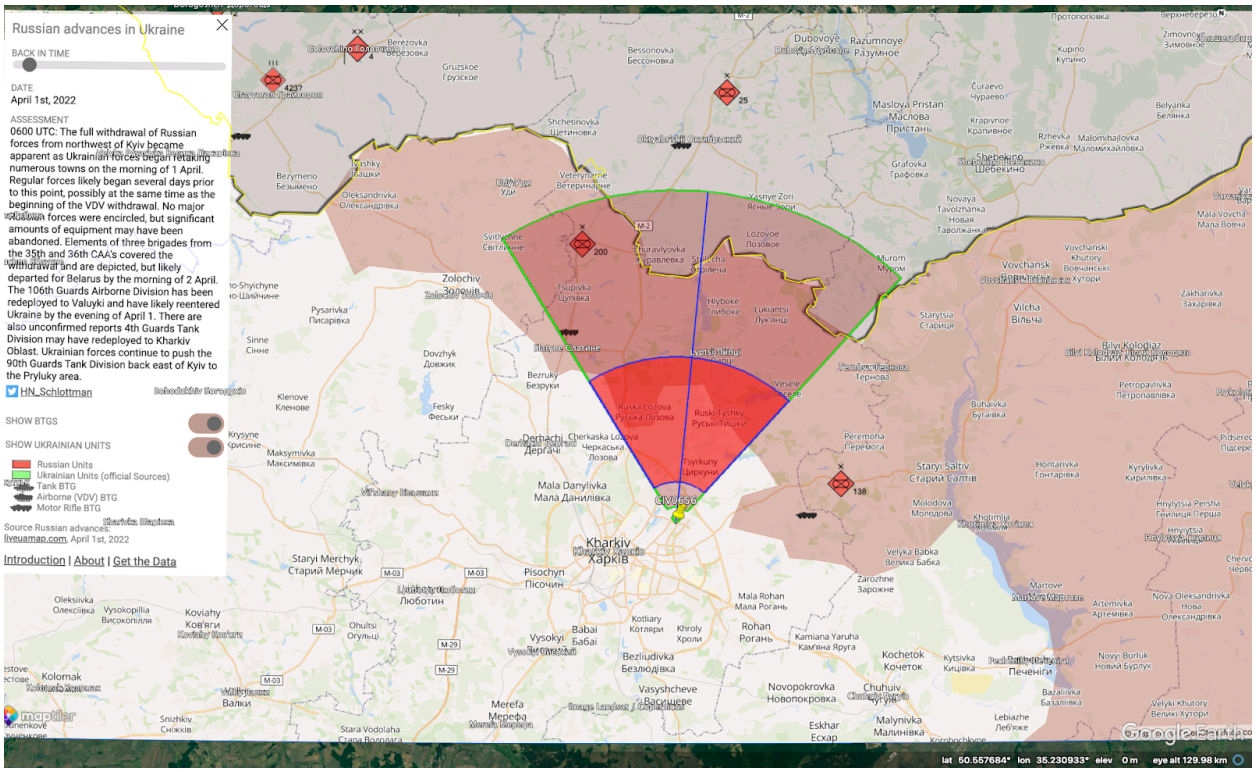
The range of the 122mm ammunition for the BM-21 MLRS varies depending on the type. On average, the range of the Grad rocket is reported to be between 5 km and 20 km[20]. The absolute range of the Grad rockets is reported between 2 km and 40 km[21]. Grad systems usually fire rockets from distances close to their maximum range of 20km[22]. Since it is not possible to identify the type of Grad rocket depicted at the CIV0656 scene, both the absolute and average range will be reflected on the satellite imagery to cover the use of all possible variants of Grad rocket modifications.



The area of origin of the Grad rocket depicted at the CIV0656 scene is marked on the satellite imagery. The bright red area with blue outline indicates the average reported range of a Grad rocket (between 5 km and 20 km), while the pale red area with yellow outline indicates the maximum reported range of a Grad rocket. Blue line indicates the munition's likely direction of origin (5.6 degrees) based on the direction of its inclination (Credit: Maxar Technologies/Google Earth Pro).

[18] https://www.youtube.com/watch?v=yR6dX56amW4
[19] https://cat-uxo.com/explosive-hazards/rockets/122mm-grad-9m22u-rocket
[20] https://aoav.org.uk/2021/what-is-a-grad/
[21] http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/
[22] http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/

According to the reported open source information on conflict parties' troop movements on 01/04/2022, the Russian armed forces, and the 200th Separate Motorized Rifle Brigade in particular, were present within the estimated area of origin both in the territories of Ukraine and Russia.



Russian advances in Ukraine

BACK IN TIME

DATE
April 1st, 2022

ASSESSMENT
0600 UTC: The full withdrawal of Russian forces from northwest of Kyiv became apparent as Ukrainian forces began retaking numerous towns on the morning of 1 April. Regular forces likely began several days prior to this point, possibly at the same time as the beginning of the VDV withdrawal. No major Russian forces were encircled, but significant amounts of equipment may have been abandoned. Elements of three brigades from the 35th and 36th CAA's covered the withdrawal and are depicted, but likely departed for Belarus by the morning of 2 April. The 106th Guards Airborne Division has been redeployed to Valuyki and have likely reentered Ukraine by the evening of April 1. There are also unconfirmed reports 4th Guards Tank Division may have redeployed to Kharkiv Oblast. Ukrainian forces continue to push the 90th Guards Tank Division back east of Kyiv to the Pryluky area.

HN_Schlottman

SHOW BTGS

SHOW UKRAINIAN UNITS

🟥 Russian Units
🟩 Ukrainian Units (official Sources)
Tank BTG
Airborne (VDV) BTG
Motor Rifle BTG

Source Russian advances: liveuamap.com, April 1st, 2022

Introduction | About | Get the Data

An overlay of the reported presence of the Russian armed forces on 01/04/2022 and the estimated area of the munition origin. Bright red indicates the average range of all types of Grad rockets, while pale red outlined in green indicates the maximum possible range of all types of Grad rockets (Credit: UAWarData[23]; Liveuamap[24]; GICHD[25]; Maxar Technologies/Google Earth Pro).

The 200th Separate Motorized Rifle Brigade is reported[26] to include the 382nd Separate Rocket Artillery Battalion, which uses BM-21 MLRS within the Brigade Artillery Group, reportedly using 18 BM-21 Grad MLRS as of 2019.

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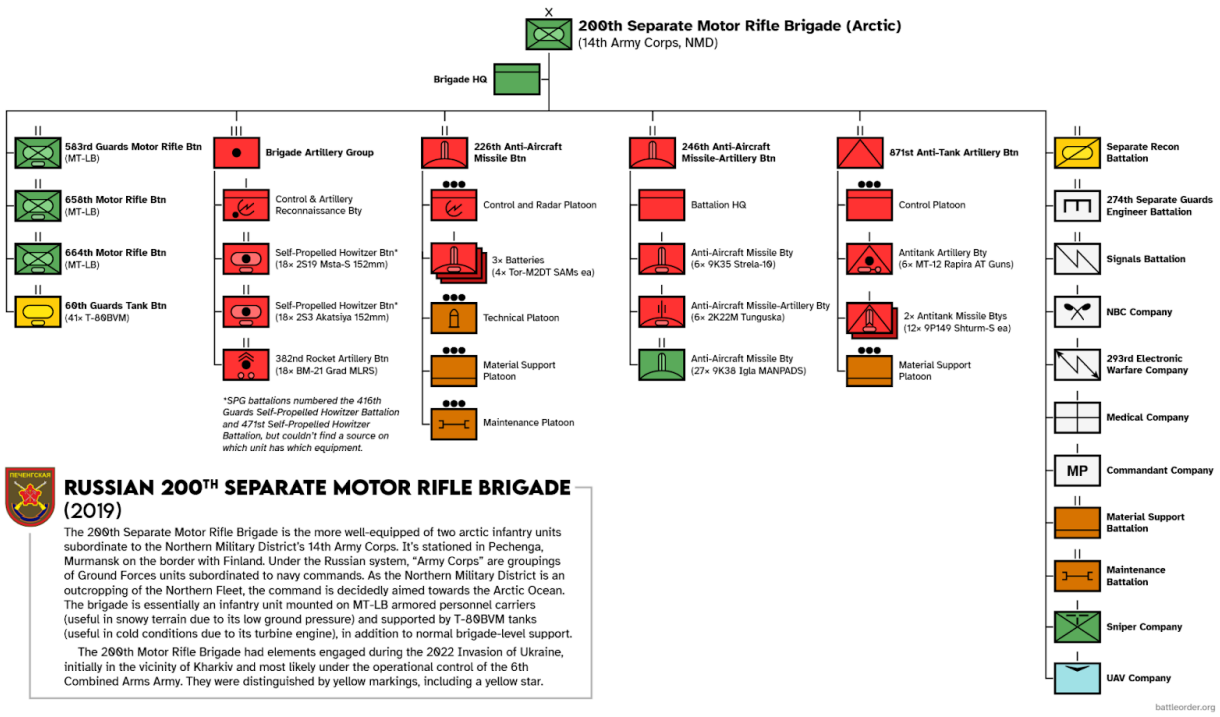
[23] https://uawardata.com/
[24] https://liveuamap.com/
[25] http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/
[26] https://static.wixstatic.com/media/a137e0_35b30959589044e3be145fc6bd40e950~mv2.png

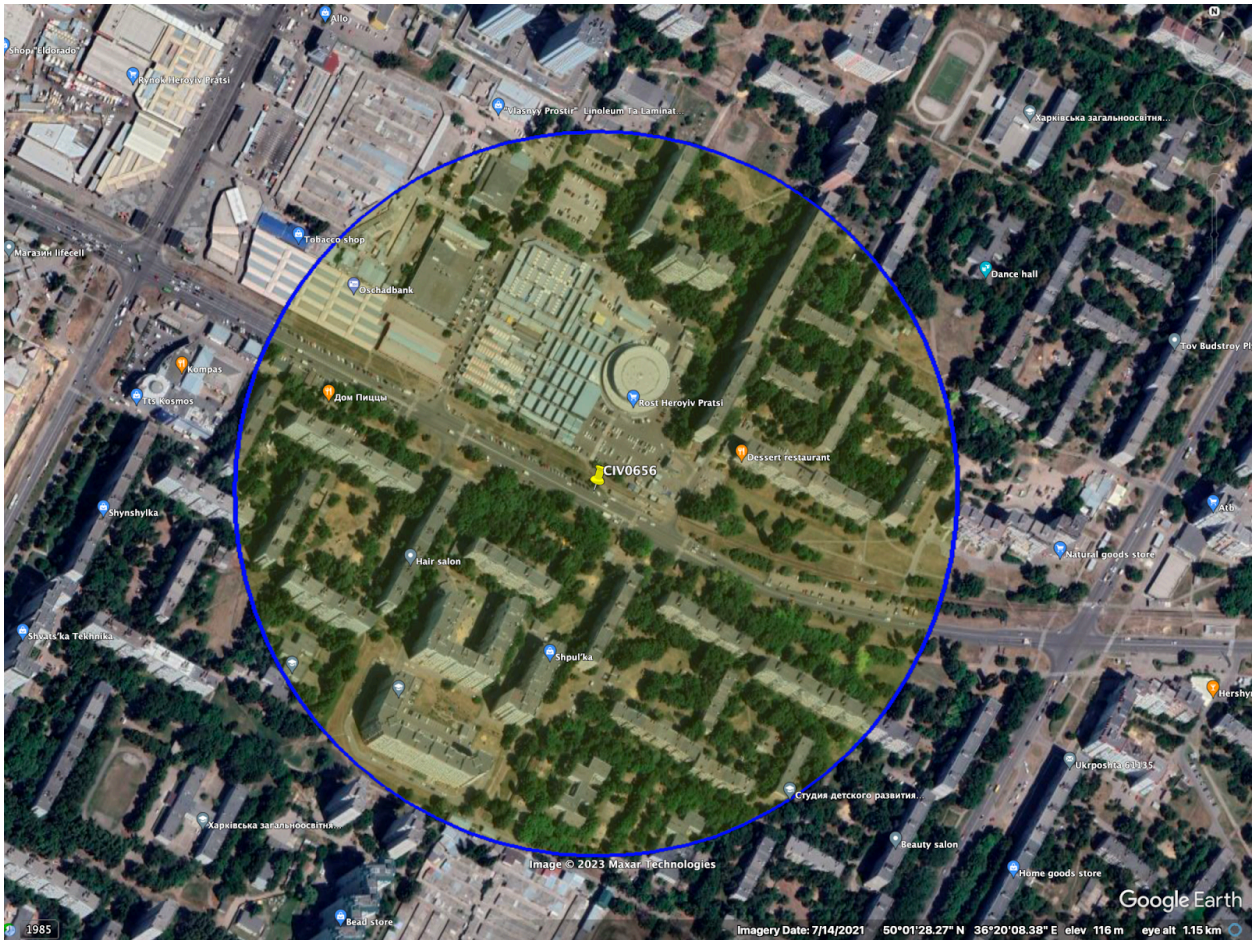


200th Separate Motor Rifle Battalion organization, as of 2019.

Are There Any Indications of What the Location Was Being Used for?

CIV0656 occurred in the 524th microdistrict of Saltivka district in Kharkiv. Based on the results of computer modeling[27] available in open sources, a cluster salvo of 40 high-explosive Grad rockets creates a lethal area of 36 hectares (600 m x 600 m). According to available satellite imagery from 14/07/2021, the location of the incident is a residential area which consists largely of residential condominiums, shopping malls, building material market, soccer fields, and restaurants.

27 http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/#:~:text=The%20BM%2D21%20was%20introduced,et%20al.%2C%202013



Location of the CIV0656 as seen on the satellite imagery from14/07/2021. The green area indicates the 600 x 600 m area possibly targeted by the Grad rocket (Credit: Maxar Technologies/Google Earth Pro).

Were There Military Structures, Installations, Troops, Or Other Assets In The Area?

No military structures, installations, troops, or other assets were identified within a 1 km area of the CIV0656 scene.

Has the Area Been Targeted More than Once? When?

Saltivka district of Kharkiv was reported to be under heavy artillery shelling since the beginning of Russia's full-scale invasion on 24/02/2022.

Timeline of the Incident

On 01/04/2022, a photograph depicting what appears to be remnants of a Grad rocket was posted[28] on Facebook. From at least 29/03/2022 until 01/04/2022 Saltivka district of Kharkiv

[28] https://www.facebook.com/photo?fbid=443136087609746&set=pcb.443136594276362

was under daily shelling, and as such it is not possible to establish the earliest possible date of the incident. However, it could not have taken place later than 10:01 EET on 01/04/2022, when the imagery of the scene was posted on Facebook.

Statements from Parties of the Conflict

Ukraine

Head of the Kharkiv Administration Oleh Synyehubov reported 170 strikes using Grad rockets in Kharkiv.[29]

Russia

None identified.

Conclusion

No later than at 10:01 EET on 01/04/2022, the motor section of an unidentified type of Grad rocket impacted the road near 38 Heroiv Pratsi street in front of the ROST supermarket located in Saltivka, the residential area of Kharkiv, at 50.0223, 36.3416[30]. Based on the identified materials, it was not possible to establish the date when this incident took place.

The 200th Separate Motorised Rifle Brigade as of 2019 was reported to have 18 BM-21 Grad MLRS. On 01/04/2022, it reportedly was in the area where the rocket motor section possibly originated from.

No military assets or troops were reported in the area of impact on 01/04/2022. No information concerning casualties among the civilian population or damage to civilian infrastructure that could be linked to the munition remnant was identified in open sources.

Further Action

Request satellite imagery within the identified area of munition origin and continue monitoring reports concerning the area for further information that could be published.

[29] https://kharkivoda.gov.ua/ru/news/115125
[30] https://maps.app.goo.gl/5LTY9t7P6cvYwUx48