

Príloha č. 1: Opis predmetu zákazky

Predmetom zákazky je vybudovanie bezplatného WiFi pripojenia pre občanov aj návštevníkov obce prostredníctvom bezdrôtových prístupových bodov na verejných priestranstvách.

V čase vyhlásenia výzvy na predkladanie ponúk sa na verejných priestranstvách nenachádza WiFi pripojenie, ktoré by zasahovalo viac ako 30 % do pokrytia vybudovaného bezdrôtového prístupového bodu.

K pokrytiu verejných priestanstiev WiFi pripojením bude dodanie tovarov – **10 externých prístupových bodov** zahrňujúcich potrebné nevyhnutné príslušenstvo s inštaláciou a montážou WiFi siete.

Vybudovaná WiFi sieť bude používať označenie siete (SSID) WiFi pre Teba a poskytovať internetovú konektivitu s minimálnou rýchlosťou sťahovania 30 Mbps pre každý jeden WiFi bod bezplatne všetkým občanom a návštevníkom obce.

Prístupové body budú umiestnené na nižšie uvedených verejných priestranstvách:

Externý prístupový bod č. 1	Obecný úrad – LV459, p.č. 105/4
Externý prístupový bod č. 2	Kostol – LV459, p.č. 27/1
Externý prístupový bod č. 3	Park (nová oddychová zóna) – LV459, p.č. 107
Externý prístupový bod č. 4	Cintorín – LV459, p.č. 391/1
Externý prístupový bod č. 5	Kultúrny dom – LV459, p.č. 423/3
Externý prístupový bod č. 6	Autobus zastávka (na Valaliky) – LV459, p.č. 158
Externý prístupový bod č. 7	Základná škola – LV459, p.č. 7/1
Externý prístupový bod č. 8	Detské ihrisko – LV459, p.č. 389/1
Externý prístupový bod č. 9	Futbalové ihrisko – LV459, p.č. 424/1
Externý prístupový bod č. 10	Viacšportový areál – LV459, p.č. 423/1

Prístupové body, ktoré budú umiestnené na uvedených verejných priestranstvách musia splňať minimálne nasledujúce technické parametre:

Kompaktné dvojpásmové WiFi zariadenia (2,4GHz - 5 GHz), ktoré sú certifikované pre európsky trh,
Životný cyklus použitých produktov vyšší ako 5 rokov,
Stredná doba medzi poruchami (MTBF) minimálne 5 rokov,
Možnosť centrálneho manažmentu pre riadenie, monitoring a konfiguráciu siete (single point of management),
Súlad s „802.11ac Wave I, Institute of Electrical and Electronics Engineers“ (IEEE) štandardom,
Podpora 802.1x IEEE štandardu,
Podpora 802.11r IEEE štandardu,
Podpora 802.11k IEEE štandardu,
Podpora 802.11v IEEE štandardu,
Schopnosť AP obsluhovať naraz aspoň 50 rôznych užívateľov bez zníženia kvality služby,
Minimálne 2x2 MIMO (multiple-input-multiple-output),
Súlad s Hotspot 2.0 (Passpoint WiFi Alliance certification program).

Sumár aktivít a výstupov:

Projektová dokumentácia, ktorá bude obsahovať sieťové zapojenie aktívnych prvkov siete s IP adresným plánom, simuláciu pokrytie priestoru, meranie skutočného pokrytia, technické listy aktívnych prvkov, funkčný popis a vyobrazenie obsahu hotspot portálu s umiestneným logom.

Test splnenia technických parametrov (TSTP) v rámci "Wifi pre Teba"

TSTP slúži pre žiadateľa ako podklad pre špecifikáciu riešenia splňujúcu minimalné technické parametre požadovaných výzvou.

Technické parametre riešenia sú navrhnuté v súlade so schválenou Štúdiou uskutočníteľnosti <https://metais.finance.gov.sk/studia/detail/8c95df2d-700e-47ca-a1b0-4cbf3334b453?tab=documents> a musia splňať požiadavky Robustného, Spoločného a Bezpečného produktu, ktorý poskytne občanom bezplátny prístup na internet prostredníctvom Wifi pripojenia.

1. Robustný: definuje minimálne technické parametre Prístupového bodu (Access pointu), resp. ostatného HW vybavenia,
2. Spoločný: definuje minimálne podmienky pre poskytovanie kvalitného internetového pripojenia,
3. Bezpečný: definuje minimálne podmienky pre sieťovú a fyzickú bezpečnosť.

Upozornenie: výsledky tohto testu sú výlučne pre potreby žiadateľa a nie sú zárukou výsledku v procese schvaľovania žiadostí o NFP.

Otázka č.	Znenie otázky	Odkaz na relevantnú časť Technických listov (Bežne je uvedené orientačné číslo technických listov, resp. iného relevantného zdroja zodpovedajúceho konkrétnemu parametru)	Odpoveď (po kličke na bunku výberie jednu z možností)
1.	Kompaktné dvojpolamové WiFi zariadenia (2,4 GHz – 5 GHz), ktoré sú certifikované európskym ETSI?	TL - strana 3 - tabuľka WiFi - riadok Supported Channels TL - strana 1 - EU CE certifikát	Ano
2.	Životný cyklus používajúcich produktov vyšší ako 5 rokov?	TL - Standard End of Life Policy (na strane 1 v poslednom odstavci kapitoly Hardware je uvedené: „The last hardware replacement and support for advanced hardware replacement date for discontinued products is 5 years after the EOS date.“) To znamená, že AP má životný cyklus minimálne 5,5 roka	Ano
3.	Sredná doba medzi poruchami (MTBF) minimálne 5 rokov?	3 623 115 hours Jedná sa o certifikované zariadenie (Wi-Fi Alliance) https://www.wi-fi.org/certification/programs	Ano
4.	Mohlosť centrálneho managementu pre riadenie, monitoring a konfiguráciu siete (single point of management)?	TL - strana 4 - tabuľka Networking - riadok Controller Platform Support	Ano
5.	Súlad s „802.11ac Wave I, Institute of Electrical and Electronics Engineers“ (IEEE) Standardom?	TL - strana 3 - tabuľka WiFi - riadok Wi-Fi Standards	Ano
6.	Podpora 802.1x IEEE Standardu?	TL - strana 4 - tabuľka Networking - riadok 802.1x	Ano
7.	Podpora 802.11r IEEE Standardu?	TL - strana 3 - tabuľka WiFi - riadok Other Wi-Fi Features	Ano
8.	Podpora 802.11k IEEE Standardu?	TL - strana 3 - tabuľka WiFi - riadok Other Wi-Fi Features	Ano
9.	Podpora 802.11v IEEE Standardu?	TL - strana 3 - tabuľka WiFi - riadok Other Wi-Fi Features	Ano
10.	Schopnosť AP obsluhovať naraz esporaz 50 rôznych užívateľov bez zníženia kvality služieb?	TL - strana 3 - tabuľka Performance and Capacity - riadok Client Capacity	Ano
11.	Minimálne 2x2 MIMO (multiple-input-multiple-output)?	TL - strana 3 - tabuľka WiFi - riadok MIMO	Ano
12.	Súlad s Hotspot 2.0 (Passpoint WiFi Alliance certification program)?	TL - strana 3 - tabuľka WiFi - riadok Other Wi-Fi Features Jedná sa o certifikované zariadenie (Wi-Fi Alliance) https://www.wi-fi.org/certification/programs	Ano
13.	Stupeň dodávky bude projektová dokumentácia ktorá bude obsahovať sietevé zapojenie aktívnych prvkov s IP adresným plánom, Símskou polohou priezoru, Merané skutočné pokrytie, technické isty aktívnych prvkov, funkčný test a vysvetlenie obsahu hotspot portálu s umiesnením loom?	Stupeň dodávky opisu predmetu základky	Ano

Všetky otázky sú zodpovedané

Minimálne technické podmienky sú zadefinované.

Počet odpovedí „nie“	0
Počet nezodpovedaných otázok	0

Príloha č. 3 Podrobný popis prístupového bodu (AP) s väzbou na finančné limity

Položka	Merná jednotka	Počet jednotiek	Jednotková cena (v EUR bez DPH)	Vysúťažená suma celkom (v EUR < DPH)	Limity podľa Priručky pre oprávnenosť vydávajúcich POZ-OPI pre dopytovo orientované projekty „Wi-Fi pre Teba“ (max. suma za 1 AP v EUR < DPH)
Externý prístupový bod (AP) č. 1-10:					
Externý prístupový bod	ks	10	935,00 €	11 220,00 €	nevypĺňa sa
Inštalácia a konfigurácia AP	ks	10	196,50 €	2 358,00 €	nevypĺňa sa
SW manažment AP	ks	10	118,50 €	1 422,00 €	nevypĺňa sa
Celkom:				15 000,00 €	1 500,00

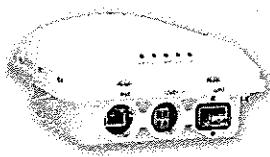
Príloha č. 4: Technické listy dodávaných aktívnych prvkov

RUCKUS® T350

Outdoor 2x2:2 Wi-Fi 6 Access Point

COMMSCOPE

RUCKUS



Benefits

SIMPLICITY

RUCKUS® Outdoor APs make Wi-Fi deployments extremely simple to deploy with one-touch technologies like SmartMesh™.

STUNNING WI-FI PERFORMANCE

Extends coverage with patented BeamFlex+ adaptive antenna technology while mitigating interference by utilizing up to 64 directional antenna patterns.

GREAT OUTDOOR WI-FI

Experience high performance outdoor Wi-Fi 6 with IP-67 weather proofing.

MULTIPLE MANAGEMENT OPTIONS

Manage the T350 Series with physical or virtual controller appliances.

SERVE MORE DEVICES

Connect more devices simultaneously with two MU-MIMO spatial streams and concurrent dual-band 2.4/5GHz radios while also enhancing non-11ax device performance.

AUTOMATE OPTIMAL THROUGHPUT

ChannelFly® dynamic channel technology uses machine learning to automatically find the least congested channels. You always get the highest throughput the band can support.

MORE THAN WI-FI

Support services beyond Wi-Fi with RUCKUS IoT Suite, Cloudpath security and onboarding software, SPoT Wi-Fi locationing engine, and SCi network analytics.

Modern Wi-Fi device users expect reliable connectivity—anywhere, anytime. But in crowded outdoor venues with thousands of users and constant RF noise, they are often frustrated by poor coverage, dropped connections, and reduced data rates. These aggravating Wi-Fi experiences can easily translate to negative perceptions of the venue and the service provider, resulting in loss of business. The quality of the network experience becomes the "litmus test" for acceptance or rejection.

As the market leader in outdoor Wi-Fi deployments, RUCKUS knows that one AP solution cannot meet every possible challenge of varied and complex outdoor requirements. This is why the RUCKUS T350 Wi-Fi 6 series is designed with more variety than any other outdoor AP in the market today. Available with either internal omni-directional antennas or internal high-gain directional antenna models, the T350 Series uses patented RUCKUS antenna optimization and interference mitigation technologies to improve throughput, connection reliability, and deliver industry-leading Wi-Fi 6 performance to every connected client. At the same time, the T350 Series is designed for fast, simple installation with an ultra-lightweight, low profile, IP-67 rated enclosure that can stand up to the most challenging outdoor environments.

At RUCKUS, we know that outdoor AP deployments are especially challenging for installation and maintenance, which is why RUCKUS outdoor APs use a variety of technologies, like SmartMesh that help simplify outdoor AP deployment.

The RUCKUS T350 Series is perfect for high-density outdoor public venues such as airports, convention centers, plazas, malls, smart cities, and other dense urban environments. By providing a superior Wi-Fi experience to every user in high-density outdoor locations, venue operators can improve guest satisfaction and loyalty, deliver new kinds of wireless application services, and increase revenues.

The RUCKUS T350 Series incorporates patented technologies found only in the RUCKUS Wi-Fi portfolio.

- Extended coverage with patented BeamFlex+ utilizing multi-directional antenna patterns.
- Improve throughput with ChannelFly, which dynamically finds less congested Wi-Fi channels to use.

Whether you're deploying ten or ten thousand APs, the T350 Series is easy to manage through RUCKUS' appliance and virtual management options.

RUCKUS® T350

Outdoor 2x2:2 Wi-Fi 6 Access Point

Access Point Antenna Pattern

RUCKUS' BeamFlex+ adaptive antennas allow the T350 AP to dynamically choose among a host of antenna patterns in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage
- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the RUCKUS BeamFlex+ adaptive antenna directs the radio signals per-device on a packet by-packet basis to optimize Wi-Fi coverage and capacity in real-time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

Figure 1. Example of BeamFlex+ pattern

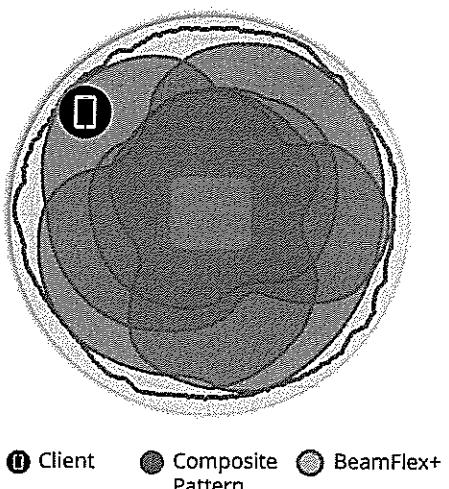


Figure 2. 2.4GHz Azimuth Antenna Patterns

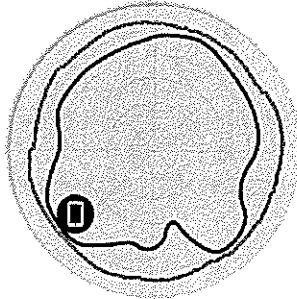


Figure 3. 5GHz Azimuth Antenna Patterns

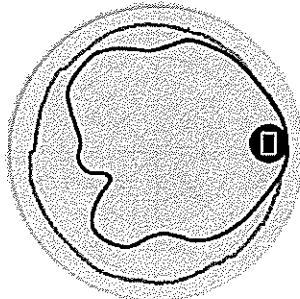


Figure 4. 2.4GHz Elevation Antenna Patterns

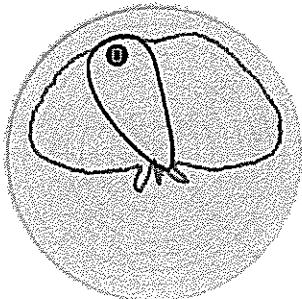
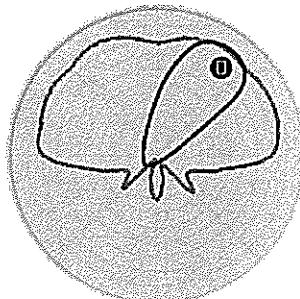


Figure 5. 5GHz Elevation Antenna Patterns



Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.

RUCKUS® T350

Outdoor 2x2:2 Wi-Fi 6 Access Point

Wi-Fi	
Wi-Fi Standards	<ul style="list-style-type: none"> IEEE 802.11a/b/g/n/ac/ax
Supported Rates	<ul style="list-style-type: none"> 802.11ax: 4 to 1774 Mbps 802.11ac: 6.5 to 867 Mbps 802.11n: 6.5 to 300Mbps 802.11a/g: 6 to 54 Mbps 802.11b: 1 to 11 Mbps
Supported Channels	<ul style="list-style-type: none"> 2.4GHz: 1-13 5GHz: 36-64, 100-144, 149-165
MIMO	<ul style="list-style-type: none"> 2x2 SU-MIMO 2x2 MU-MIMO
Spatial Streams	<ul style="list-style-type: none"> 2 streams SU/MU MIMO 5GHz 2 streams SU/MU MIMO 2.4GHz
Radio Chains and Streams	<ul style="list-style-type: none"> 2x2:2 (5GHz) 2x2:2 (2.4GHz)
Channelization	<ul style="list-style-type: none"> 20, 40, 80MHz
Security	<ul style="list-style-type: none"> WPA-PSK, WPA-TKIP, WPA2-Personal, WPA2-Enterprise, WPA3-Personal, WPA3-Enterprise, AES, 802.11i, Dynamic PSK, OWE WIPS/WIDS
Other Wi-Fi Features	<ul style="list-style-type: none"> WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v Hotspot, Hotspot 2.0 Captive Portal WISPr

5GHz Receive Sensitivity											
VHT20				VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-97	-78	-75	-73	-95	-77	-71	-69	-92	-74	-68	-66
HE20				HE40				HE80			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-97	-78	-72	-67	-95	-77	-69	-64	-92	-74	-66	-61

2.4GHz TX Power Target											
Rate Pout (dBm)											
MCS0 HT20	23										
MCS7 HT20	18										
MCS8 VHT20	17										
MCS9 VHT40	16.5										
MCS11 HE40	15										

5GHz TX Power Target											
Rate Pout (dBm)											
MCS0 VHT20	22										
MCS7 VHT40, VHT80	20										
MCS9 VHT40, VHT80	19										
MCS11 HE20, HE40, HE80	15										

RF				
		T350c	T350d	T350se
Antenna Type		Internal omnidirectional	Internal omnidirectional	Internal 120 deg sectorized + N-type female external connectors
		BeamFlex+ adaptive internal antennas with polarization diversity		
Antenna Gain (max)		Up to 3dBi		2.4GHz: 6dBi 5GHz: 8dBi
Peak Transmit Power (Tx port/chain + 3dB Combining gain)		2.4GHz: 26 dBm 5GHz: 25 dBm		2.4GHz: 26dBm 5GHz: 25dBm
Frequency Bands		<ul style="list-style-type: none"> ISM (2.4-2.484GHz) U-NII-1 (5.15-5.25GHz) U-NII-2A (5.25-5.35GHz) U-NII-2C (5.47-5.725GHz) U-NII-3 (5.725-5.85GHz) 		

Performance and Capacity											
Peak PHY Rates				2.4GHz: 574 Mbps 5GHz: 1200 Mbps							
Client Capacity				Up to 512 clients per AP							
SSID				Up to 31 per AP							

Ruckus Radio Management											
Antenna Optimization				<ul style="list-style-type: none"> BeamFlex+ Polarization Diversity with Maximal Ratio Combining (PD-MRC) 							
Wi-Fi Channel Management				<ul style="list-style-type: none"> ChannelFly Background Scan Based 							
Client Density Management				<ul style="list-style-type: none"> Adaptive Band Balancing Client Load Balancing Airtime Fairness Airtime-based WLAN Prioritization 							
SmartCast Quality of Service				<ul style="list-style-type: none"> QoS-based scheduling Directed Multicast L2/L3/L4 ACLs 							
Mobility				<ul style="list-style-type: none"> SmartRoam 							
Diagnostic Tools				<ul style="list-style-type: none"> Spectrum Analysis SpeedFlex 							

2.4GHz Receive Sensitivity											
HT20		HT40		VHT20		VHT40					
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-97	-78	-94	-75	-97	-78	-94	-75	-97	-78	-94	-75
HE20				HE40				HE80			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-97	-78	-73	-67	-94	-75	-70	-64	-92	-74	-66	-61

RUCKUS® T350

Outdoor 2x2 Wi-Fi 6 Access Point

NETWORKING			POWER ²		
			T350c	T350d	T350se
Controller Platform Support	<ul style="list-style-type: none"> SmartZone ZoneDirector Unleashed Cloud Standalone 				
Mesh	<ul style="list-style-type: none"> SmartMesh™ wireless meshing technology. Self-healing Mesh 				
IP	<ul style="list-style-type: none"> IPv4, IPv6 				
VLAN	<ul style="list-style-type: none"> 802.1Q (1 per BSSID or dynamic per use based on RADIUS) VLAN Pooling Port-based 				
802.1X	<ul style="list-style-type: none"> Authenticator & Suplicant 				
Tunnel	<ul style="list-style-type: none"> L2TP, GRE, soft-GRE 				
Policy Management Tools	<ul style="list-style-type: none"> Application Recognition and Control Access Control Lists Device Fingerprinting Rate Limiting 				
IoT	<ul style="list-style-type: none"> T350d: Integrated BLE and Zigbee (1 radio, switchable) 				
PHYSICAL INTERFACES			CERTIFICATIONS AND COMPLIANCE		
Ethernet	1 x 1GbE port, RJ-45 PoE In - 802.3at Class 4		Wi-Fi Alliance ³		
USB	—	1 USB 2.0 port, Type A	<ul style="list-style-type: none"> Wi-Fi CERTIFIED™ a, b, g, n, ac Wi-Fi CERTIFIED™ 6 WPA3™ - Enterprise, Personal Wi-Fi Enhanced Open™ Wi-Fi Agile Multiband™ Wi-Fi Optimized Connectivity™ Wi-Fi Vantage™ WMM™ Passpoint™ 		
DC Power	—	12V DC Terminal Block (7V - 20V)	Standards Compliance ⁴		
PHYSICAL CHARACTERISTICS			SOFTWARE AND SERVICES		
			Location Based Services		
			<ul style="list-style-type: none"> SPoT 		
			Network Analytics		
			<ul style="list-style-type: none"> SmartCell Insight (SCI) RUCKUS Analytics 		
			Security and Policy		
			<ul style="list-style-type: none"> Cloudpath 		
MODEL FEATURE DIFFERENCES					
Model		Antenna	Low Temp	USB	DC Power
T350c		Internal omni	-20°C	N	N
T350d		Internal omni	-40°C	Y	Y
T350se		Internal sector (120°) + External antenna capable	-40°C	Y	Y

² Max power varies by country setting, band, and MCS rate.

³ For complete list of WFA certifications, please see Wi-Fi Alliance website.

⁴ For current certification status, please see price list.

RUCKUS® T350

Outdoor 2x2:2 Wi-Fi 6 Access Point

ORDERING INFORMATION		OPTIONAL ACCESSORIES
T350 OUTDOOR APs		
901-T350-XX20	T350c, omni, outdoor access point, 2x2:2 Wi-Fi 6 internal BeamFlex+, dual band concurrent. One Ethernet port, PoE input, -20°C to 65°C Operating Temperature. Includes mounting bracket and one year warranty. Does not include PoE injector.	902-0162-XXXX <ul style="list-style-type: none">• PoE Injector (24W) (Sold in quantities of 1, 10 or 100)
901-T350-XX40	T350d, omni, outdoor access point, 2x2:2 Wi-Fi 6 Internal BeamFlex+, dual band concurrent. One Ethernet port, PoE input, DC input and USB port, -40°C to 65°C Operating Temperature. Includes mounting bracket and one year warranty. Does not include PoE injector.	902-0125-0000 <ul style="list-style-type: none">• Secure articulating mounting bracket 902-0127-0000 <ul style="list-style-type: none">• Extended cap to accommodate up to 6 cm long USB dongle
901-T350-XX51	T350se, sector+external, outdoor access point, 2x2:2 Wi-Fi 6, internal 120 degree sector + external antenna capable, dual band concurrent access point. One Ethernet port, PoE input, DC input and USB port, -40°C to 65°C Operating Temperature. Includes adjustable mounting bracket and one year warranty. Does not include PoE injector.	902-1121-0000 <ul style="list-style-type: none">• Spare weatherizing cable gland with option of one hole or 2 hole connection 902-0183-000 <ul style="list-style-type: none">• Spare cable gland for weatherizing the RJ-45 ports on outdoor APs.

See RUCKUS price list for country-specific ordering information. PLEASE NOTE: When ordering outdoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam.

Warranty: Sold with a limited one year warranty.

For details see: <http://support.ruckuswireless.com/warranty>

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Príloha č. 5: Zoznam subdodávateľov

P. č.	Obchodné meno a sídlo subdodávateľa	IČO	Údaje o osobe oprávnenej konať za subdodávateľa (v rozsahu: meno a priezvisko, adresa pobytu, dátum narodenia)	% podiel na zákazke	Predmet subdodávok
1	Bez subdodávateľov				