

Appendix A

Initial Contentions Regarding Non-Infringement of U.S. Patent Nos. 8,891,347 (“347 Patent”), 9,094,888 (“888 Patent”), 10,368,361 (“361 Patent”) and 8,554,196 (“196 Patent”)

Subject to and without waiving the foregoing objections, Verizon responds as follows:

For at least the reasons set forth below, there is no infringement of any Asserted Claim¹ of an Asserted Patent (directly and/or indirectly, literally and/or under the doctrine of equivalents²) by Verizon’s use of devices that are capable of operating in a 4G LTE network or 5G network and have been sold or operated in the United States. Verizon will provide expert opinions regarding the details for why it has never infringed any valid and enforceable Asserted Claim and will disclose the identities and opinions of such experts in accordance with the schedule set by the Court’s Docket Control Order.

Verizon’s responses below respond to the allegations made to date, and Verizon reserves the right to supplement its response to this interrogatory with information responsive to any supplemental contentions by Cobblestone. As identified in correspondence and Verizon’s Responses and Objections to Cobblestone’s Interrogatories and any supplements thereto, Cobblestone infringement contentions for each of the Asserted Patents are deficient and fail to identify with particularity the Accused Instrumentalities or how they function.

Cobblestone has also failed to identify where, in the Accused Instrumentalities, each of the accused functionalities is met or performed. Cobblestone has also failed to specifically articulate any infringement theories under the doctrine of equivalents or provide any hypothetical equivalent

¹ As used in this response, “Asserted Claims” means the claims identified in Cobblestone’s March 13, 2023 Infringement Contentions.

² Although Cobblestone’s Infringement Contentions allege that, each Asserted Claim is infringed or has been infringed under the doctrine of equivalents in Defendants’ Accused Instrumentalities, Cobblestone provides no detailed contentions supporting a claim under the doctrine of equivalents for any Asserted Claim elements.

[REDACTED]

claim necessary to determine whether there is ensnarement of the prior art. Cobblestone has also failed to specifically identify what actions by Verizon are alleged to constitute active inducement or contributory infringement of each patent. Cobblestone has thus failed to show that Verizon indirectly infringes (through inducement or contributory infringement) any of the Asserted Claims.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The following provides additional patent-by-patent responses.

I. The '347 Patent

For at least the reasons set forth below, there is no infringement of claims 1-4, 6-12, 14-17, and 19-23 of the '347 Patent (directly and/or indirectly, literally and/or under the doctrine of equivalents) by any of the Accused Instrumentalities.

Cobblestone contends that instrumentalities in Verizon's network contain "(a) cellular base stations that support 3GPP 5G NR ("New Radio") communications, (b) 4G LTE cellular base stations that support handover to or from 5G NR cellular base stations, [and] (c) user equipment that supports 3GPP 5G NR communications." *E.g.*, Verizon Infring. Cont. Cover Pleading at 1. Verizon disagrees. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. Cobblestone has also not alleged or shown that its patent

[REDACTED]

is essential to practicing any mandatory portion of the LTE or NR Standard. Thus, Cobblestone must show infringement based on evidence of how Verizon's network is actually implemented and cannot rely on the standard alone to show infringement.

For several claim elements, Cobblestone points to 3GPP TR documents. *See, e.g.,* Verizon Infring. Cont. Ex. A at *passim*, e.g., 5, 17, 19 etc. Technical Reports are not 3GPP Technical Specifications and do not represent an industry standard for the purposes of analyzing infringement. Likewise, for several elements, Cobblestone points to various textbooks, White Papers, and O-RAN specifications. *See, e.g.,* Verizon Infring. Cont. Ex. A at *passim*, e.g., 9-19 etc. (citing 5G New Radio (NR) : Physical Layer Overview and Performance IEEE Communication Theory Workshop, (NR Physical Layer Design: Physical layer structure, numerology and frame structure Workshop on 3GPP submission towards IMT-2020, (O-RAN.WG4.CUS.0-v05.00, Technical Specification). These submissions do not represent industry standards for the purposes of analyzing infringement.

Cobblestone's allegations for this patent are limited to cellular base stations that support 3GPP 5G NR beamforming, and (2) cellular user equipment (UE) that supports 3GPP 5G NR beamforming. Cobblestone has not shown or alleged that any other component in any other base station or user equipment infringes any claim of the '347 Patent. For example, Cobblestone has not shown that a 4G eNB infringes any of the asserted claims.

Verizon incorporates by reference all technical specifications, documents, and/or source code identified or cited by Cobblestone in its Infringement Contentions, including any supplements thereto. Verizon further incorporates by reference the responses of Defendants and Intervenor Nokia and Ericsson to Common Interrogatory No. 7. Verizon further incorporates by reference any discussion of Intervenor Nokia, Ericsson regarding the operation of their accused products

[REDACTED]

and source code.

Verizon's responses below should not be viewed as an admission that any claim is valid and not indefinite. Verizon maintains that each of the claims below is not valid, and thus cannot be infringed.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Verizon incorporates by reference

Intervenors Nokia's and Ericsson's Appendix A.

Claim 1

Based on Verizon's present investigation, at least the following claim elements are not met (directly and/or indirectly, literally and/or under the doctrine of equivalents) by any of the Accused Instrumentalities. Moreover, Cobblestone has not and cannot show direct infringement by a single actor. Cobblestone cannot show that Defendants are liable for infringement under § 271(a) because it cannot show any acts through an agent or contracts with another to perform one or more steps of the claimed method in Claims 1-7. Moreover, Cobblestone cannot show that Defendants condition participation in an activity or receipt of a benefit upon the performance of steps of Claim 1-7 and that Defendants establish the manner or timing of that performance.

Non-Infringement of U.S. Patent 8,891,347	
Claim Language	Evidence of Non-Infringement
1[pre] - A method for wireless	Cobblestone has not shown that the Accused Instrumentalities perform the claimed method.



Non-Infringement of U.S. Patent 8,891,347	
Claim Language	Evidence of Non-Infringement
communication in a system including a transmitter, a receiver, and a plurality of propagation paths formed between the transmitter and the receiver which are capable of carrying a signal transmitted by the transmitter to the receiver, the method comprising:	Cobblestone cites TR 38.901 v15.0.0 and TS 38.300 V2.0.0 in its infringement contentions. Verizon Infring. Cont. at 1.³ Neither of those documents purport to describe how the Accused Instrumentalities operate, nor is the functionality described in a technical report required for a base station and UE to interoperate on Verizon's network. Verizon incorporates Nokia and Ericsson's responses to this claim element by reference.
1[a] - transmitting a first signal from the transmitter to the receiver via a first propagation path of the plurality of propagation paths;	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, transmit a first signal from the transmitter to the receiver via a first propagation path of the plurality of propagation paths. Cobblestone has not shown that a plurality of propagation paths can be formed between the transmitter and the receiver and therefore has failed to show the limitation requiring a plurality of propagation paths. Cobblestone has not identified a first signal, a first path, or a plurality of propagation paths. For example, Cobblestone's infringement contentions state "the base station initially transmits via a narrow-beam antenna to the UE." Verizon Infr. Cont. at 6. It has not identified a path from the narrow beam antenna or a first signal. Base stations can transmit multiple signals from different antenna elements which are coherently combined. It is also unclear from Cobblestone's contentions what it contends the "plurality of propagation paths" are or how those paths are formed. Cobblestone has failed to show how the Accused Instrumentalities transceivers are configured to transmit on more than one path or that the Accused Instrumentality deployed forms a plurality of propagation paths. <i>See also</i> 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions); 3GPP TS 38.212 v16.2.0 (and all similar versions); 3GPP TS 38.211 v16.2.0 (and all similar versions); 3GPP TS 38.213 v16.2.0 (and all similar versions); 3GPP TS 38.200 v2.0.0

³ Unless otherwise noted, all citations to Verizon Infringement Contentions in the 347 Patent Section are references to Exhibit A.



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Claim Language	Evidence of Non-Infringement
	(and all similar versions) for additional details about CSI-RS and its use in 5G NR Verizon incorporates Nokia's and Ericsson's responses to this claim element by reference. Cobblestone's infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein.
1[b] - receiving the first signal at the receiver;	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, receive the first signal at the receiver. Cobblestone has not specifically identified what aspects of the Accused Instrumentalities constitute the receiver, and has not shown that the same first signal transmitted by the transmitter is the same signal received by the receiver. Cobblestone's infringement contentions state that "the UE receives the initial transmission" for this limitation. Verizon Inf. Cont. at 6. Cobblestone has failed to identify how the "initial transmission" in its infringement contentions constitute the first signal of the claim. <i>See also</i> 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions); 3GPP TS 38.212 v16.2.0 (and all similar versions); 3GPP TS 38.211 v16.2.0 (and all similar versions); 3GPP TS 38.213 v16.2.0 (and all similar versions); 3GPP TS 38.200 v2.0.0 (and all similar versions) for additional details about CSI-RS and its use in 5G NR Verizon incorporates Nokia's and Ericsson's responses to this claim element by reference. Cobblestone's infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein.
1[c] - performing a channel estimation	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, perform a channel estimation



Non-Infringement of U.S. Patent 8,891,347	
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based on the first signal to obtain path parameter information of the first propagation path;	based on the first signal to obtain path parameter information of the first propagation path. Cobblestone has not shown how the channel estimation is performed based on the first signal. Cobblestone’s infringement contentions state “the UE performs link channel state estimation based on the first signal.” Verizon Inf. Cont. at 7. As stated above, Cobblestone has failed to identify a first signal, and therefore has failed to show how channel state estimation is performed on that signal. Moreover, the link channel estimation identified by Cobblestone is not performed on a first signal. For example, the 3GPP standard cited by Cobblestone states the “same coding and modulation is applied to all groups of resource blocks belonging to the same L2 PDU scheduled to one user within one TTI and within a MIMO codeword.” 3GPP TS 38.200 v2.0.0 § 5.2.5.1. Cobblestone has not shown that the Accused Instrumentalities obtain path parameter information. <i>See</i> ’347 Patent, at 8:4-16, 11:59-12:6, 14:18-24. Finally, Cobblestone has not shown that path parameter information is of the first propagation path. Instead, Cobblestone only explains that “link channel state estimation based on the first signal,” “includes information that is required by the gNB.” Verizon Infr. Cont. at 7. <i>See</i> TS 38.211 v16.2.0 § 7.4.1.5 To the extent that Cobblestone alleges that CQI, PMI, CSI-RS, SSBRI, LI, RI, SS-RSRP, CSI-RSRP, L1-RSRP, L1-SINR, or best beam reports are path parameter information, that is incorrect. <i>See, e.g.</i>, 3GPP TS 38.133 v16.2.0 (and all similar versions); 3GPP TS 38.214 v. 16.2.0 (and all similar versions); TS 38.215 v16.2.0 (and all similar versions). ’347 Patent, at 8:4-16, 11:59-12:6, 14:18-24. Channel state/status information is not path parameter information. <i>See</i> TS 38.214 § 5.1.6; TS 38.214 § 5.1.6.1; TS 38.214 § 5.2.1; TS 38.214 § 5.2.5; TS 38.138 § 10.1.6. <i>See also</i> 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions)3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions); 3GPP TS 38.212 v16.2.0 (and all similar versions); 3GPP TS 38.211 v16.2.0 (and all similar versions); 3GPP TS 38.213 v16.2.0 (and all similar versions); 3GPP TS 38.200 v2.0.0 (and all similar versions) for additional details about CSI-RS and its use in 5G NR.

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Non-Infringement of U.S. Patent 8,891,347	
Claim Language	Evidence of Non-Infringement
	 Verizon incorporates Nokia’s and Ericsson’s responses to this claim element by reference. Cobblestone’s infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein.
1[d] - sending the channel estimation that includes the path parameter information from the receiver to the transmitter via the first propagation path;	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, send the channel estimation that includes the path parameter information from the receiver to the transmitter via the first propagation path. Cobblestone’s infringement contentions state “In at least TDD mode (as used by 5G NR FR2 with beamforming), the uplink transmission uses the same propagation path (via reciprocity) as the downlink transmission.” Verizon Infring. Cont. at 8. Cobblestone has made no attempt to show how the products operate in FR1 or FDD mode. No channel estimation is sent from the receiver to the transmitter via the first propagation path. Further, as explained above for element 1[c], no path parameter information is obtained from a channel estimation and thus is not sent from the receiver to the transmitter via the first propagation path. Finally, Cobblestone has not shown that the information Cobblestone apparently accuses to meet these limitations is sent by the Accused Instrumentalities on the same first propagation path in the uplink as it was sent in the downlink. Cobblestone has also failed to show that UE sends the estimated channel state back to the gNB. TS 38.211 v16.2.2 § 7.4.1.5. <i>See also</i> 3GPP TS 38.133 v16.2.0 (and all similar versions); 3GPP TS 38.214 v. 16.2.0 (and all similar versions); TS 38.215 v16.2.0 (and all similar versions); 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions); 3GPP TS



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Claim Language	Evidence of Non-Infringement
	38.212 v16.2.0 (and all similar versions); 3GPP TS 38.211 v16.2.0 (and all similar versions); 3GPP TS 38.213 v16.2.0 (and all similar versions) for additional details about CSI-RS and its use in 5G NR. Verizon incorporates its analysis from claim element 1[c]. Verizon incorporates Nokia’s and Ericsson’s responses to this claim element by reference. Cobblestone’s infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein. This limitation is also subject to prosecution history estoppel. <i>See</i> Verizon’s First Suppl. Resp. to Interrog. 12.
1[e] - predistorting a second signal at the transmitter in a time domain, a frequency domain, and a spatial domain, according to the channel estimation based on the first signal;	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, predistort a second signal at the transmitter in a time domain, a frequency domain, and a spatial domain, according to the channel estimation based on the first signal. Cobblestone’s infringement contentions states that a “5G NR signal with beamforming is a predistorted signal in time, frequency, and space.” Verizon Infring. Cont. at 9. That is simply incorrect. Beamforming is not predistorting, and Cobblestone has not shown that any signal is predistorted in time, frequency, and space. [REDACTED] [REDACTED] Cobblestone’s infringement contentions state that “applicable time and frequency subcarriers are selected based on the returned CSI, and an appropriate spatial beam refinement is selected based on the returned CSI.” Cobblestone Infring. Cont. at 9. Selecting a subcarrier is not predistorting a signal. [REDACTED] [REDACTED]. Moreover, the signal is not



Non-Infringement of U.S. Patent 8,891,347	
Claim Language	Evidence of Non-Infringement
	predistorted in all three of the time domain, frequency domain, and spatial domain according to the channel estimation. <i>See also</i> 3GPP TS 38.133 v16.2.0 (and all similar versions); 3GPP TS 38.214 v. 16.2.0 (and all similar versions); TS 38.215 v16.2.0 (and all similar versions); 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions); 3GPP TS 38.212 v16.2.0 (and all similar versions); 3GPP TS 38.211 v16.2.0 (and all similar versions); 3GPP TS 38.213 v16.2.0 (and all similar versions) for additional details about CSI-RS and its use in 5G NR. Verizon incorporates its analysis from claim element 1[c]-[d]. Verizon incorporates Nokia's and Ericsson's responses to this claim element by reference. Cobblestone's infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein. This limitation is also subject to prosecution history estoppel. <i>See</i> Verizon's First Suppl. Resp. to Interrog. 12.
1[f] - transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path; and	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path. Verizon incorporates its analysis from claim element 1[c]-[e]. For example, the alleged second signal is not transmitted via the first propagation path.  <i>See also</i> 3GPP TS 38.133 v16.2.0 (and all similar versions); 3GPP TS 38.214 v. 16.2.0 (and all similar versions); TS 38.215 v16.2.0 (and all similar versions); 3GPP TS 38.300 v16.2.0 (and all similar versions); 3GPP 38.331 v16.2.0 (and all similar versions); 3GPP TS 38.212 v16.2.0 (and all similar versions); 3GPP TS 38.211 v16.2.0



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Claim Language	Evidence of Non-Infringement
	(and all similar versions); 3GPP TS 38.213 v16.2.0 (and all similar versions) for additional details about CSI-RS and its use in 5G NR. Verizon incorporates Nokia’s and Ericsson’s responses to this claim element by reference. Cobblestone’s infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein.
1[g] - receiving the predistorted second signal at the receiver.	Cobblestone has not shown that the Accused Instrumentalities, and the Accused Instrumentalities do not, receive the predistorted second signal at the receiver. Verizon incorporates its analysis from claim element 1[c]-[g]. Verizon incorporates Nokia’s and Ericsson’s responses to this claim element by reference. Cobblestone’s infringement contentions make no specific allegation for this claim limitation under the doctrine of equivalents. Therefore, Cobblestone has not and cannot show how any accused feature perform substantially the same function/way/result as any limitation contained herein.

Claim 2

Based on Verizon’s present investigation, claim 2 is not infringed because it depends on claim 1, which is not infringed for the reasons explained above. *See Duncan Parking Techs., Inc. v. IPS Grp., Inc.*, 914 F.3d 1347, 1360 (Fed. Cir. 2019) (citation omitted) (“One who does not infringe an independent claim cannot infringe a claim dependent on (and thus containing all the limitations of) that claim.”). In addition, based on Verizon’s present investigation, at least the