Linear structure of functions with maximal Clarke subdifferential ?

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In this paper we establish that the set of Lipschitz functions $f : U ? R$ (U a nonempty open subset of $`1 d$ ) with maximal Clarke subdifferential contains a linear subspace of uncountable dimension (in particular, an isometric copy of $` ? (N)$). This result follows along a similar line to that of a previous result of Borwein and Wang (see [Proc. Amer. Math. Soc., 128 (2000), pp. 3221?3229; Bull. Aust. Math. Soc., 72 (2005), pp. 491?496]). However, while the latter was based on Baire?s category theorem, our current approach is constructive and is not linked to uniform convergence. In particular, we establish lineability (and spaceability for the Lipschitz norm) of the above set inside the set of all Lipschitz continuous functions.