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## 1. Introduction

Following a meeting between the Parish Council (PC) and Balfour Beatty (BB), it was agreed to carry out some grip reinstatement along the B4221 between the Millennium Hall and Hilltop. Following heavy rainfall at Christmas, it was evident that road water was not entering the roadside ditches and was, instead, cascading down the road, eroding and damaging the surface and edges. Video and photographic evidence shows the ditch on the north side of the B4221 completely dry during heavy rainfall.

A total of 23 grips have been reinstated between the gate at Chicory Crop and Hilltop and photographic evidence collected on 20<sup>th</sup> February after 24 hours of rainfall shows clearly that two areas of flooding have been reduced and some further minor work would alleviate the problems completely.

There now remains the task of identifying all existing ditches in the Parish along the B4221 and B4224 and planning a programme of grip cutting in an efficient and cost-effective manner.

The grips cut on the B4221 were of varying shape, size and quality and there were concerns raised that the workmanship could have been better. This document also proposes a design for grips and a procedure for finishing the works to create a better visual impact.

Finally, opening some grips will expose deficiencies within some of the ditches where they have neither been used nor cleared for many years. Whilst we can sit and argue over the respective responsibilities for clearing these, the cost of repairing the damage to our roads far outweighs the small investment in clearing blocked parts of ditches. Engagement with farmers and landowners rather than threatening them would seem a far more sensible way to progress by seeking their assistance rather than demanding their service. What ever the legal rights and wrongs, we need to clear our ditches in a cost effective and efficient manner and reduce the financial burden of carrying out unnecessary road repairs.

This report currently only covers one section of the B4221 and the B4224 but will be developed in phases to cover the entire length of both roads over the coming months. There are currently 5 additional road sections to be considered.

## 2. Summary

### 2.1. Chicory Crops to Hilltop – See Appendix 1 for map showing locations

- Clear 40 metres of ditch between Millennium Hall gate and 30 mph sign on north side of road (DE001 to GR003)
- Additional grip on lower side of Welsh Water access (GR006)
- Jet culverts at Felhampton (CU009 & 010)
- Trial hole to establish existence of culvert at Woodley Gate footpath (CU017)
- Two additional grips into ditch between Hilltop and Woodley Gate (GR18 and 19)
- Grip to be modified to catch water from C road (GR020)
- Dig trial hole/slit trench to find a solution for road flooding at Hilltop

This work could be carried out by the Parish Lengthsman if funding was available.

### 2.2. Crow Hill Junction to South Herefordshire Golf Club (SHGC) – See Appendix 2

- Provide additional roadside grips to force water into ditch at Spring Meadow – Section 1
- Extend ditch from Spring Meadow to Lower Rylands – Section 1
- Provide culvert under Lower Rylands access if not there – Section 1
- Dig grips to force water into existing ditch down to road culvert – Section 2
- Dig grips into ditch at culvert – Section 3
- Dig grips to force water into existing ditch between Sandford farm and Rudhall Brook – Section 4

### 2.3. SHGC to Bromsash

- Out of Upton Bishop but grips need to be re-established into good ditches to alleviate serious road damage

### 2.4. Grip Design

Some comparisons appear in the document of grips recently dug. As a result, a drawing of the ideal grip has been proposed in the Appendix 3. All grips should be cut too at least this standard.

### 3. Chicory Crop to Hilltop – B4221

Several jobs remain incomplete that will close out the issues along this stretch of road:

- 3.1. A forty-metre section between the Hall gate and the 30 mph sign needs the ditch lowering by about 600mm. (DE001 to GR003 Appendix 1)



Water is currently coming through the culvert under the Chicory Crop entrance but is flooding out onto the road because of the blockage in the ditch. This is a perfect example of how digging grips is showing up the shortcomings in the ditch profile.

The second photograph shows this; the end of the ditch that can be seen is the culvert coming under the Chicory Crop access and because the ditch needs lowering the blockage is forcing water out onto the road.



Ditches and Grips – Proposal for Improvement

3.2. Welsh Water Entrance (GR006 App 1)

Water is flowing out of the new culvert and into the ditch. This ditch has not had water flowing in it for years and the flow now continues on down to the culvert crossing at the Hall. However, some water is still running down the roadside and it would benefit from an additional grip dug at the edge of the access road to prevent this.



3.3. Felhampton (CU9 & 10 App 1)

The flooding across the road at Felhampton has been largely alleviated, but a small amount of work would resolve the issues completely. The flow of water coming out of the Welsh Water culvert represents the flow into the ditch at Felhampton as can be seen here. Unfortunately, it is being forced out onto the road by a single blocked culvert about 30 yards up. This can all be resolved by jetting the culvert.





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There are two culverts at this location, one under the footpath which is the lower of the two which must be partially clear as water is flowing out of it.

Looking in the opposite direction, i.e. down the hill, the picture on the right shows the culvert under the field access is blocked and it is this that is forcing the flow of water out onto the road. This culvert was exposed by BB during their grip excavation work but it is clearly blocked as the next picture shows.



The sad thing about this is that all of the water in the ditch is as a result of the new grips successfully cut further up the hill. This blockage is spoiling all of the good work done further up. Again, water is flowing down here for the first time in years and the only thing preventing the water staying off the road is this single blocked culvert. A short blast with a jetting nozzle would resolve this issue and stop water from re-entering the carriageway.

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3.4. Woodley Gate Footpath Culvert (CU017 Appendix 1)

The ditch that runs from Woodley Gate to Hilltop is clean and clear but bone dry. However, at the lower end where it finishes, there is evidence that there may be a culvert. It was expected that this would be exposed by BB but although a grip has been dug at this point, insufficient excavation has been carried out to prove if the culvert is there or not.

Additional work is needed to establish whether it exists and two additional grips are need into this ditch to divert road surface water into the ditch.

3.5. Woodley Gate to Hilltop (CU018 and 019 Appendix 1)

Two additional grips needed to clear water from road into the ditch which is currently still dry even though water is running down the road edge.

3.6. Hilltop (GR020)

There remain two issues at Hilltop. The first is a simple modification to the shape of the grip as agreed at the site meeting. Water is currently missing the grip/ditch and flowing out onto the B4221.





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The second problem is the flooding that still exists whenever it rains and whilst this has been partly alleviated by digging a grip on the south side, there remains a significant road traffic hazard, especially as this is next to a bus stop.



It was hoped that BB would investigate the possible existence of a culvert beneath the C road, but this did not happen. Clearly this situation cannot be allowed to persist and the digging of a trial hole/slit trench about 1 metre deep adjacent to the kerb would prove either way if the culvert exists. If it does it will need cleaning and opening out into the ditch pictured above. If it does not, an alternative way of draining the road will need to be found. Either way a solution is needed.



## 4. Crow Hill to SHGC – See Appendix 2

### 4.1. Spring Meadow to Lower Rylands (see Section 1 in Appendix 2)

During the site visit, the attention of BB was drawn to the problems at Spring Meadow. Water is running down the B4224 and needs channelling into the roadside ditch. Grips would help. Unfortunately, this ditch only runs for about 30 metres before ending and the water then pours back onto the road.



This is an example of where a roadside ditch is needed to clear the road. It is not a landowner issue. The damage that is being done to the carriage way is immense and the small cost of digging a roadside ditch would be insignificant compared to the costs of repairing the already damaged road surface. Edge erosion on this section is spectacular and up to 200 mm deep in places. A cyclist slipping into this trench could be seriously injured or killed.

4.2. Lower Rylands to Road Culvert (Section 2 in Appendix 2)

It is unclear if a culvert exists under the access to Lower Ryland but this could be installed if not at low cost in comparison to the road damage that is being inflicted.



Just past Lower Ryland at the point where the road edge erosion starts there is clear evidence of a roadside ditch that is completely dry while the water ravages the road edge. This is not verge erosion, the carriageway is clearly damaged.

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A series of grips cut at an acute angle to force the water into the ditch are needed. This may force the problem further down, but it needs chasing to its conclusion to force the water to the culvert at Section 3 and into the drainage system there.





4.3. Culvert Crossing between Felhampton and Sandford Farms  
(See Section 3 Appendix 2)

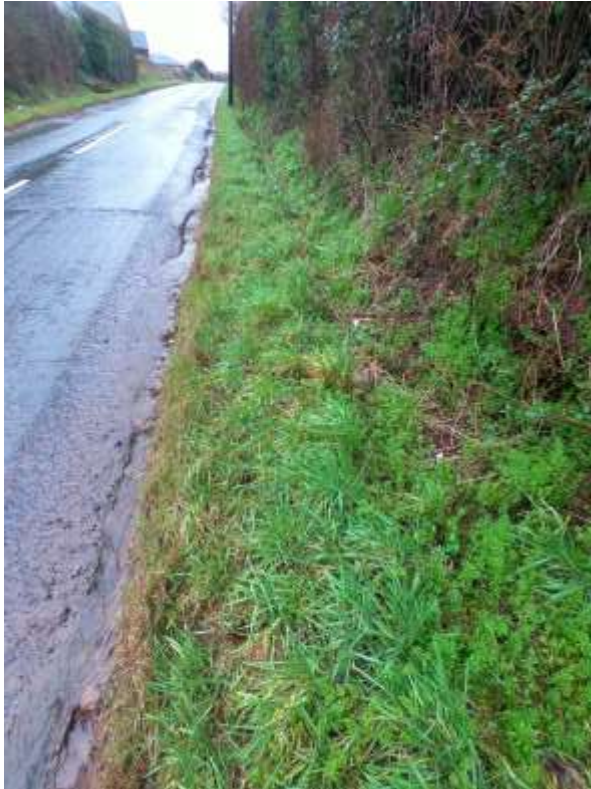
Water from Felhampton is flowing freely into the roadside ditch and across the road in the culvert. This flows out onto the fields of Sandford Farm and away, as the riparian rules intend. Free flow of water across adjacent land parcels. At the crossing, the road regularly floods, and BB were asked to visit this spot to recommend options to alleviate this. It is not clear that this happened. It is clear when looking at the roadside ditch that there were grips at one time that have been allowed to fill in resulting in serious damage to the road edge. Again, water flows freely down the damaged road while the ditch remains dry. Grips need to be re-established to alleviate this flood area.





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4.4. Sandford Farm to Rudhall Brook



Below the farm there is evidence of ditches on both sides of the road, both of which were dry while water flooded down the road causing further edge erosion.

Grips are needed cut at acute angles to force this water into the ditch and down towards the M50 crossing. It is unclear what happens when this ditch ends but forcing the water into the ditch will show if there is a culvert.



In 2019, water was gushing down the road under the M50 but this problem appears to have been resolved although it is not clear by whom.

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Below the M50, where the ditch recommences a culvert is running freely into the ditch and on down to Rudhall Brook although further ditch and grip clearance may be needed on this lower section.





## 5. SHGC to Bromsash

Although this is Linton Parish, it is worth pointing out the massive amount of road damage being done on this section. Frustratingly, there is a perfectly good roadside ditch running the length of the golf club that is completely dry. There is even evidence of old grips that no longer function.



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There is also serious flooding at the edge of Bromsash that has still not been resolved despite prior visits by BB.





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## 6. B4221 – Hilltop to M50

6.1. Not yet reviewed

## 7. Crow Hill to Windy Hollow

7.1. Not yet reviewed

## 8. Phocle Green – Windy Hollow to Parish Boundary

8.1. Not yet reviewed

## 9. B4224 – Crow Hill to Edge of Settlement (40 mph )

9.1. Not yet reviewed

## 10. B4224 – Crow Hill to Old Gore Crossroads

10.1. Not yet reviewed

## 11. Grip design

It is unclear if there is any recognised method or design for a grip and there is no apparent size or shape that will fit every occasion. However, it is clear that there are certain parameters that must be met if the grip is to serve its purpose.

### 11.1. Grips cut at 90 degrees



Grips cut in this way have limited ability to capture water flowing past them. Water will tend to run straight past. The grip is narrow, there is little clear definition of the side walls and spoil piled at the sides will simply wash back in. The bottom of the grip is only just below road level and will quickly silt up again.

11.2. Grips Cut at 45 degrees



Grips cut at an angle are more likely to encourage water to flow from the road into the ditch. However, the uphill edge is still shaped to discourage this. The depth of the grip is better sitting well below the road surface.



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Grips dug at 45 Degrees with lead-in Edge



Of all the grips cut by BB on the B4221, this one stands out as being the best. Although it would benefit from a little more taken from the bottom, the sides are well defined, the lower face is at 45 degrees, and the upper face is cut back at a much more acute angle to encourage water to run off the road. The mouth at the roadside is much wider and the throat is at least 600 mm wide. This should be the standard for all grips.



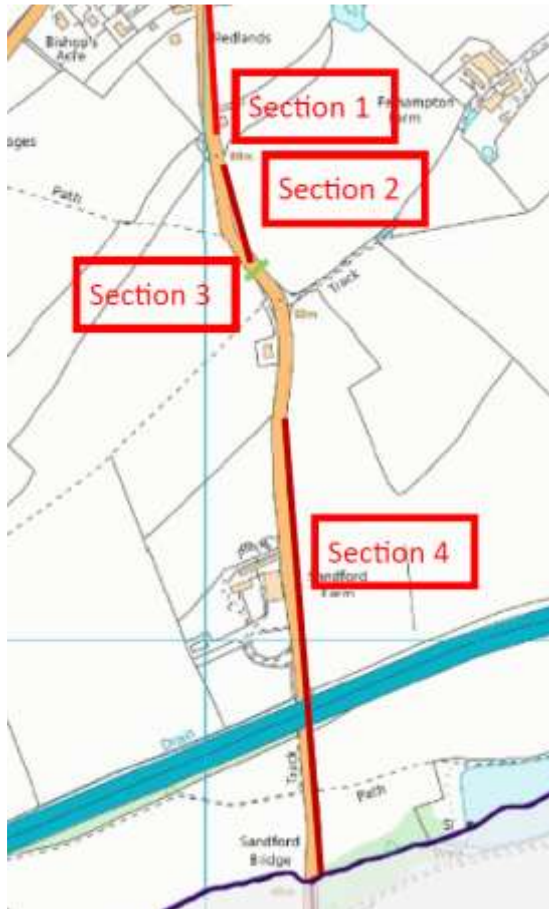
# Appendix 1



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## Appendix 2



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## Appendix 3

# Suggested Grip Layout



## Suggested Straight Grip Layout—Plan

Ditch—throat of grip at least 600 mm wide



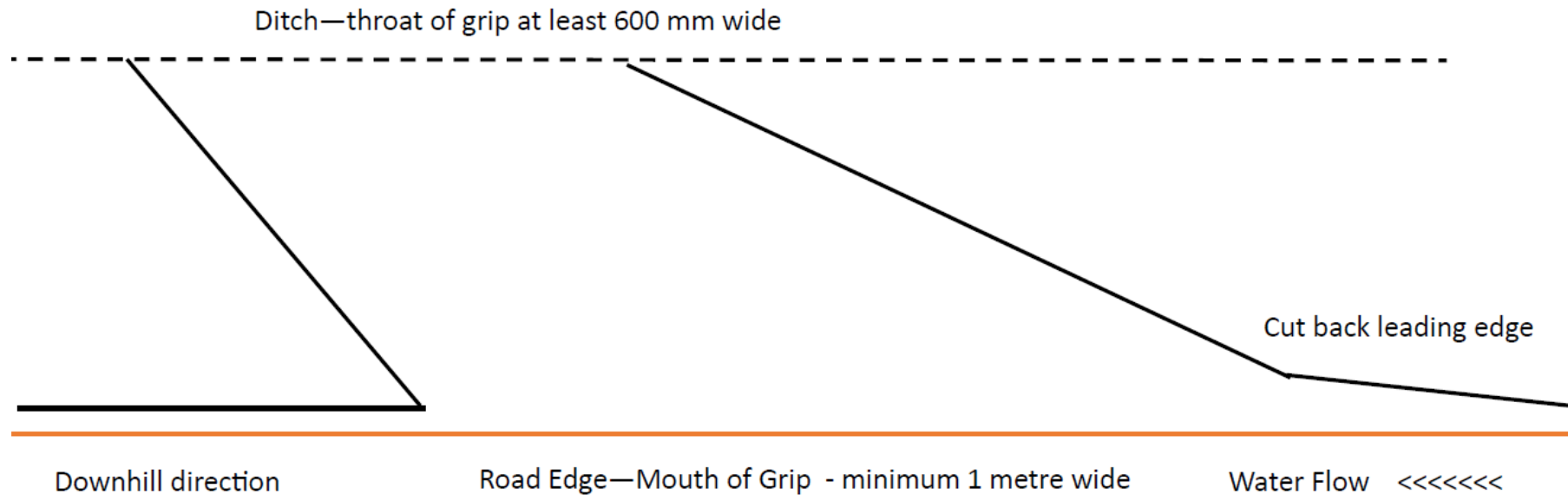
Downhill direction

Road Edge—Mouth of Grip - 0.6 to 1 metre wide

Where the road is not on a hill a 90 degree grip may be acceptable if there is sufficient road camber to direct water into the grip

- Grip faces should be clearly defined
- Grip base should be at least 30 mm below road edge and falling towards ditch
- Spoil should be spread evenly along top of verge and tamped to prevent it washing back in to ditch

## Suggested Angled Grip Layout—Plan View



- Grip faces should be clearly defined
- Grip base should be at least 30 mm below road edge and falling towards ditch
- Downhill edge should be cut ideally at 45 degrees to road
- Uphill edge should ideally be cut at least 60 degrees to road and leading edge cut back
- Spoil should be spread evenly along top of verge and tamped to prevent it washing back in to ditch
- Where the road is flat a 90 degree grip may be acceptable but should always be cut taking account of the direction of water flow