

# Creating a digital smart flood warning system for surface water flooding in West Yorkshire

## LoRaWAN Sensor Mount Options: Concept Note

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## Document purpose

This note provides practical suggestions for proposed mounting options for the LoRaWAN Flood sensors, based on the existing mount concept, the site photos, and the recent design discussion. The aim is to support review of what would be most feasible for installation at the identified sites. This document is supplemented by a detailed spreadsheet which includes detailed dimension, cost and source for the parts needed for the proposed mount models. Generative AI has been used to produce schematics for the proposed mounts.

## Current design approach

The preferred design direction is a **fixed horizontal cantilever arm with a diagonal brace**, rather than a swivel, telescopic, or flexible arrangement. This reflects the need for a mount that is simple, stable, and practical for field use, and which is less likely to sag or move in poor weather. If needed for a swivel arm, sourcing link is shared within the spreadsheet.

The design has been developed using the existing profile-based sensor mount as the main reference and keeping practical reusability in mind, with two main alternative fixing methods considered:

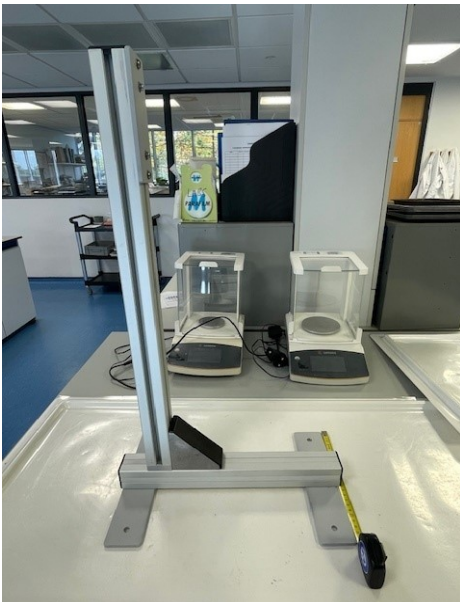
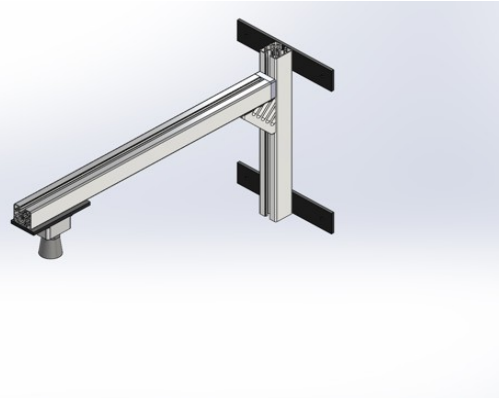


Fig: Existing sensor mount



## Alternative designs

### 1. Spike-post version

- upright support fixed into the ground using a driven spike
- horizontal cantilever arm projecting over the water
- diagonal brace to improve rigidity

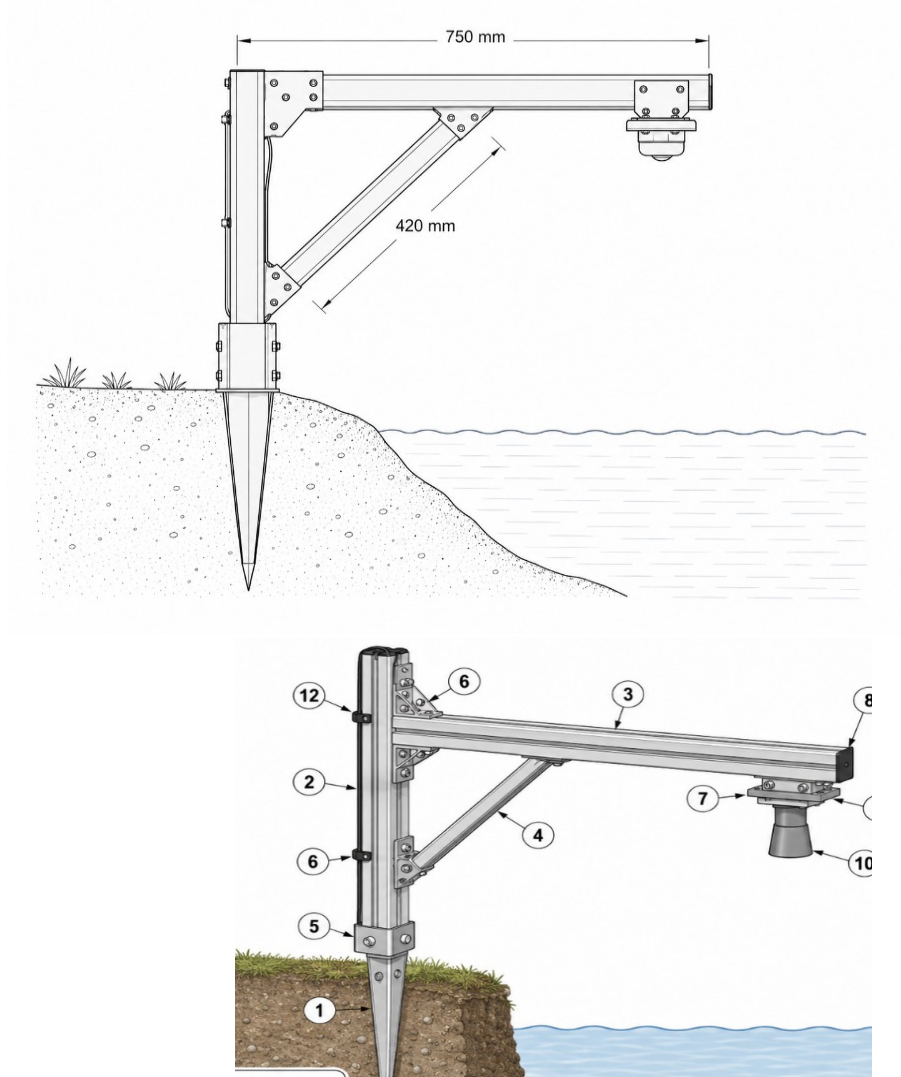


Fig 1: Spike post mount (AI generated schematic)

2. **Ground-drilled / bolt-down version**

- upright support fixed into a drilled or bolted base
- horizontal cantilever arm projecting over the water
- diagonal brace to improve rigidity

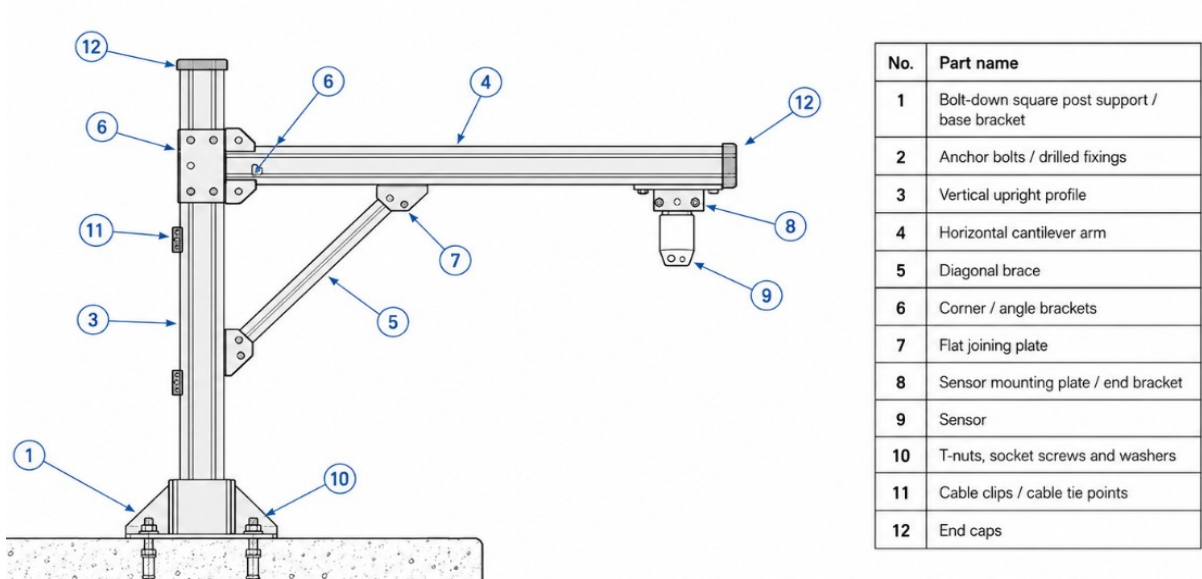


Fig 2: Ground drilled mount (AI generated schematic)

A **wall-drilled version** may also remain relevant at some locations, depending on the condition of the wall and whether drilling is acceptable.



Fig 3: Wall drilled mount (AI generated picture for better understanding)

### **Assumed working dimensions**

At this stage, the following dimensions have been used as practical working assumptions:

- **Horizontal cantilever arm:** 750 mm
- **Diagonal brace:** 420 mm
- **Arm orientation:** horizontal
- **Sensor position:** mounted at the end of the arm, facing downward over the water

These are intended as indicative design dimensions and may still need adjustment depending on the final site and fixing arrangement.

### **Site-related observations**

From the site photos and discussion to date, different sites may suit different mount types:

- **Reid Park Avenue-private Garden:** may be more suited to a spike-in-ground arrangement if the bank material allows it
- **Parklands Court:** may be more suited to a drilled or wall-fixed arrangement if the wall condition is appropriate

### **Sensor mounting considerations**

The mount must accommodate the required sensor orientation, with the sensing face directed downward over the water. Different sensors may require slightly different end-fixing details, so the end bracket or plate may need to vary between sensor types even if the main arm geometry remains the same.

### **Points requiring confirmation**

Before the design is treated as final, the following points should be confirmed:

- which mount type is preferred for each site
- whether drilling / bolt fixing is acceptable at the relevant locations
- whether the assumed dimensions are practical
- whether the diagonal brace length and join position are acceptable
- the preferred mounting height above the water
- whether the existing office mount is to be physically reused or used only as a design reference
- whether there are any flood, debris, or access constraints that should alter the current assumptions