

Ramp Down from Milton Walk - As Existing  
Scale 1:200 @ A0



01 - Bottom of Ramp  
Crumbling and delaminating tarmac at bottom of ramp around gully.



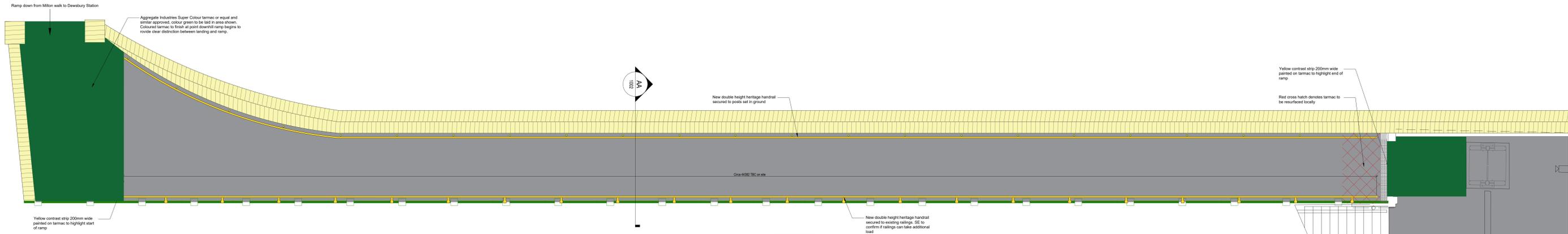
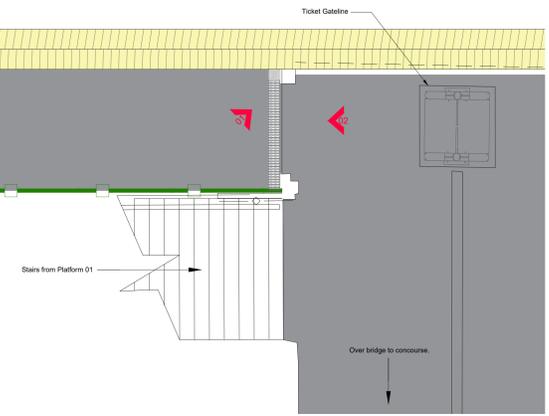
02 - Bottom of Ramp  
No colour contrast between end of ramp and landing.



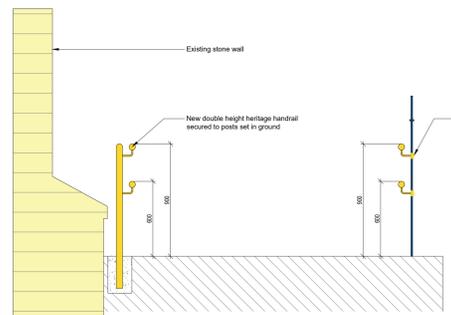
03 - Full Length of Ramp  
No handrails along entirety of ramp.



04 - Top of Ramp  
Crumbling and delaminating tarmac at top of ramp. No colour contrast between landing and start of ramp.



Ramp Down from Milton Walk - As Proposed  
Scale 1:200 @ A0



Section A-A  
Scale 1:20 @ A0

**HANDRAIL NOTES:**

The handrail proposals outlined are in line with the recommendations of "Design Standards for Accessible Railway Stations": A joint Code of Practice by the Department for Transport & Transport Scotland, supplemented by the Building Regulations Approved Document M and BS8300:2018.

**HANDRAILS SHOULD BE:**

- Of circular section
- Between 40mm and 50mm diameter, with 40 - 50mm minimum unobstructed clearance behind.
- Supported below to allow easy hand-travel along their length.
- Nylon coated or 'warm to touch' for touch comfort and colour contrast.
- Extended at least 300mm beyond top and bottom nosings of stairways or end of ramps with shaped ends and turned into wall or curved downward to just above floor level, or have a minimum rounded down-turn of 100mm.
- Top rail should be set at 900mm above rake of ramp, bottom rail 600.

Handrails shall comprise of 50mm Ø nylon coated steel tube set at 600 and 900mm above the rake of the existing surfaces. All joints to be flush. Rails shall terminate in a continuous loop as shown on Detail 02 and extend a minimum of 300mm beyond the top and bottom limits of the steps.

In addition, the ends must be connected to the next run of handrail (e.g. on the bridge deck walkway) or otherwise turn down or back or terminate in a closed end which does not project on to a route of travel.

**NEW HANDRAIL DIMENSIONS AND SPACING:**

There should be a clearance of between 50mm and 75mm between a handrail and any adjacent wall surface, and any handrail support should meet the handrail, centrally, on its underside. The clearance between the bottom of the rail and any cranked support, or continuous balustrade, should be at least 50 mm to minimize the risk of the handrail supports interrupting the smooth running of a person's hand along the rail.

**HANDRAIL FIXINGS:**

Handrail fixings should be designed to meet the loading recommendations of BS EN 1991-1-1. Care should be taken to ensure that the strength of fixings, attachments or anchorages that secure the handrail to the substrate are

adequate for the required loading, taking into account the material of the substrate, the spacing between fixings and, where the substrate is concrete, the position of the reinforcement. If there is any uncertainty as to the strength of any component in the fixing system, the design load should be increased by 50%. Reliance on the pull-out capacity of a single fixing should be avoided (see BS 6180:1999, 6.5).

At the existing railing side, include for purpose made cranked brackets with bolt clamped ends for attaching to existing railings at circa 2000mm centres. Colour to match new handrails. Include for all necessary features and fittings.

At the wall side, handrails to be welded on site to posts at circa 2000mm centres as shown on section detail and plan.

All handrails and balustrades shall be designed to comply with AD Part M, part K, BS6180 and BS6359. The handrail shall be designed and installed to resist a horizontal imposed load of not less than 0.74kN/m

**HANDRAIL MATERIALS:**

In locations subject to extremely cold or hot temperatures, handrails should not become excessively cold or hot to touch, while being of a material that, if necessary, is sufficiently robust to resist vandalism or misuse.

**NOTE:**

Since handrails are used by some people when using a ramp or stair not only for support, but also to pull themselves up and to reduce the speed of descent when going down, resistance to use the handrail (or involuntary letting go of the handrail) if it is uncomfortably cold or hot, presents a safety hazard. In extremes of cold, a person's skin can adhere to a very cold handrail and the shock can, in some people, trigger an attack of Raynaud's disease. Handrails whose surface is of a low thermal conductivity, such as timber or nylon-sleeved steel tube, are the most comfortable to touch in extremes of temperature. Handrails fabricated from metals with a relatively low thermal conductivity, such as stainless steel, are more suitable in locations where resistance to vandalism and/or low maintenance are key factors.

**FOOTINGS:**

Include for supply and lay of new 400 x 400 x 400 deep mass concrete pad foundations to suit new double handrail posts. Include for casting in, where appropriate and allow for temporary shuttering to concrete as required to allow works to progress and for striking formwork only when the concrete has developed sufficient strength to resist surface damage and stress arising during the construction period.



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