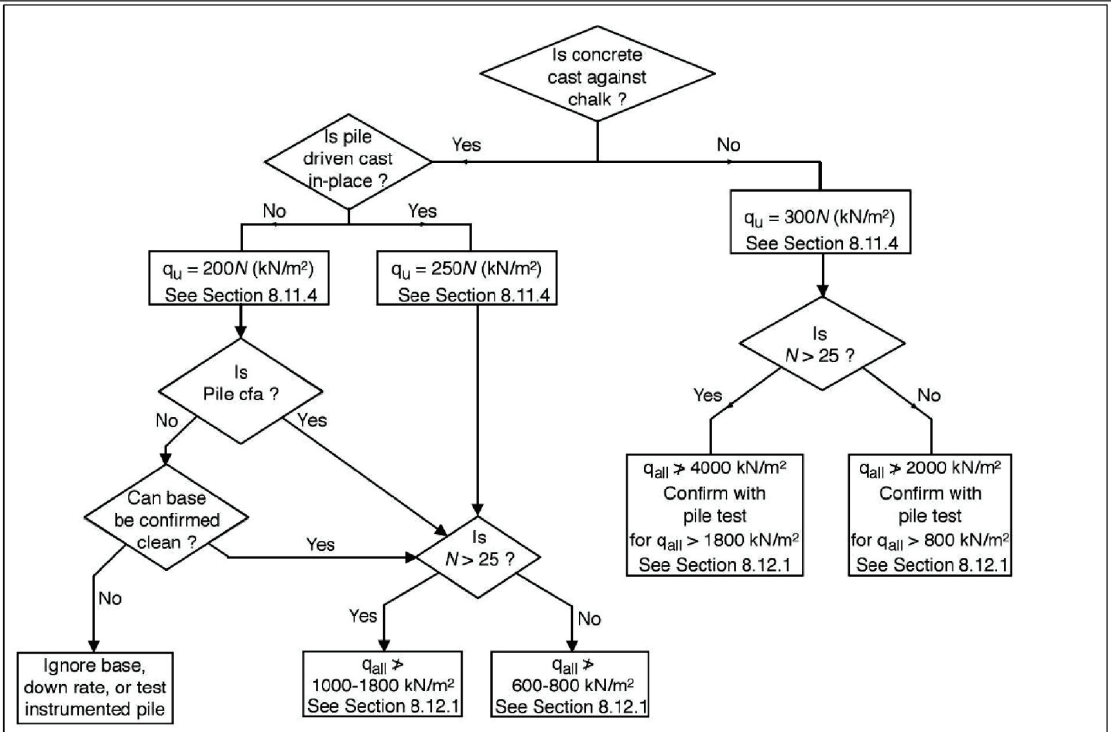
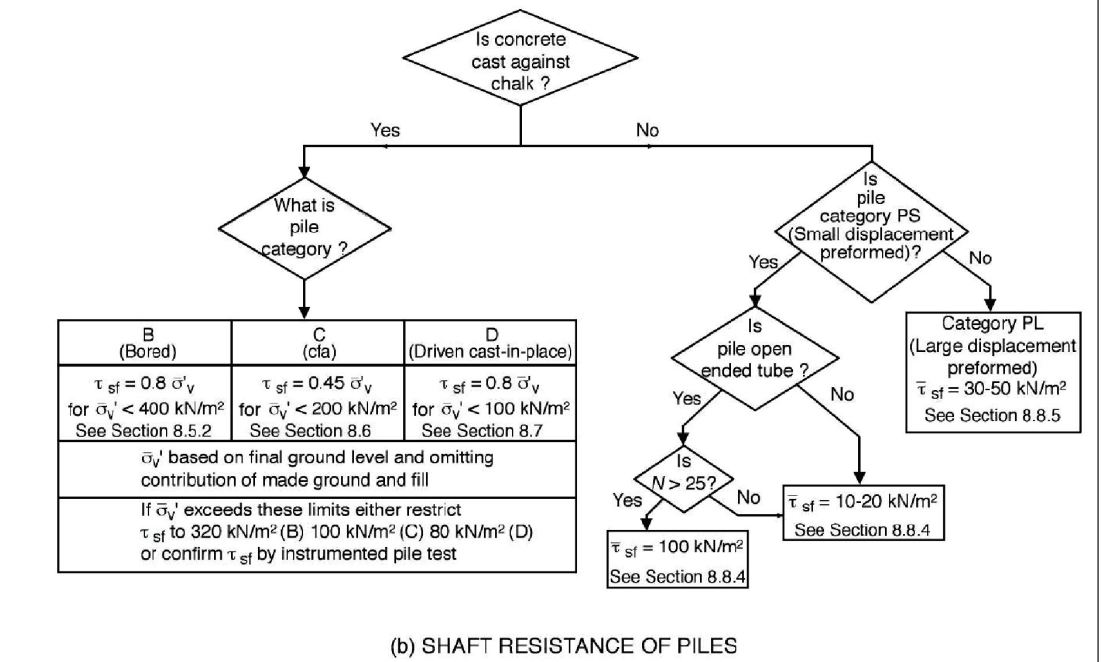


(a) BASE RESISTANCE OF PILES



B (Bored)	C (cfa)	D (Driven cast-in-place)
$\tau_{sf} = 0.8\ \bar{\sigma}'_v$ for $\bar{\sigma}_v'$ < 400 kN/m² See Section 8.5.2	$\tau_{sf} = 0.45\ \bar{\sigma}'_v$ for $\bar{\sigma}_v'$ < 200 kN/m² See Section 8.6	$\tau_{sf} = 0.8\ \bar{\sigma}'_v$ for $\bar{\sigma}_v'$ < 100 kN/m² See Section 8.7
$\bar{\sigma}_v'$ based on final ground level and omitting contribution of made ground and fill		
If $\bar{\sigma}_v'$ exceeds these limits either restrict τ_{sf} to 320 kN/m² (B) 100 kN/m² (C) 80 kN/m² (D) or confirm τ_{sf} by instrumented pile test		

(b) SHAFT RESISTANCE OF PILES

Figure 8.14 *Design guide for piles in chalk (see Section 8.12)*

Proposed foundation:

For bridge columns/piers
- Bored piles
- 2x2 group of piles
- Separation between piles 5.0x5.0 m

For bridge abutments
- Bored piles
- 2 lines of piles per abutment/bank seat

For bored piles of D=1500mm, in 2x2 groups, and with the A1 and A2 load combinations, the GEO ULS was verifies. The results indicate that the pile tip should be located at elevation 40-41m. Combination A2 was found to govern the Geotechnical design.

There is and interpreted fault at Ch. 4+150 approx. This marks zones of localised deeper weathering and disturbed ground that may affect foundation design (i.e. longer piles) of Abutments A-02N and A-02S. Targeted ground investigation is required.
Ref Borehole is CP5 (20long) with 2.6m of soil and structureless chalk, over 17.4m of weathered chalk

Appendix C – CDM designer's risk register for the River Till Viaduct

Potential hazards and risk have been defined and will be detailled in further stages, early stage and risks will continue to be considered as the design develops. A detailed risk register will be developed during detailed design.

DESIGN HAZARD ELIMINATION AND REDUCTION REGISTER

Project Name	Design Stage	Engineering Discipline	Structure	Date	Document Reference
A303 Amesbury to Berwick Down (Stonehenge) - River Till Viaduct	Tender Design	Structures	River Till Viaduct	04 February 2021	Quality Submission

Ref:	Phase C/M/D	Activity	Potential Hazards	Risk	Person(s) Affect	L	S	R	Design Measures to Eliminate Hazards	Design Measures to Reduce Risk	Residual risk information to be provided going forward	L	S	R	Included on Drawing/Document No.'s - References
1.0	C	Construction of River Till Viaduct	In-Situ construction works	Injury to workforce	Site personnel	4	4	16	Design to allow the offsite manufacture where possible to ensure controlled conditions	Identification and Communication of design advice such as guidance on the equipment to be used	Competent constracto to be used and detailed construction risk assessment to be completed upon reward of detailed design	3	4	12	
2.0	C	Construction of River Till Viaduct	Crane movement and Lifting of materials	Dropping of heavy items, material during construction resulting in injury and death, and damage to materials and tunnel.	Site personnel	3	5	15	The use of mechanical hoists to be designed where possible to reduce lifting	Identification and Communication of design advice including the correct procedure for lifting materials and the use of crash/protection decks	Contractor to follow design advice and follow appropriate lifting procedures. Protection/Crash decks to be designed	2	5	10	
3.0	C & M	Operation of Highways	Terrorist attack	Injury to public	Public	2	4	8	N/A	Security management and security features of building to be designed at detailed design stage, specialist advise to be sought at design stage	Contractor to follow design advice and build to design	1	4	4	
4.0	M	Repair and maintenance of operational highway, street furniture and landscaping	Difficulty in conducting repairs over operational highway	Vehicular accidents during maintenance causing injury and death	Public and site personnel	3	4	12	Design should be robust to ensure functionality of operational highway and design out maintenacne requirements where possible. Maintenance regime to be designed to reduce disruption and enable remote monitoring.	Safety features (such as walkways) to be designed at detailed design stage. Maintenance regime to be determined at detailed design stage	Residual risk information to be included in O&M manuals and the Health and Safety File. Closing the operational highway mitigates the risk of injury caused	1	4	4	
5.0	M	Operation of Highways	Heavier vehicle than considered in the design above River Till viaduct	Damage to the structural stability and potential breakdown	Public and road user	2	3	6	Design should be robust and take extra resistance allovable and provide itegral solutions where platic behaviour in structure could appear	Include additional signaling with the limitation of load over the bridge as per design specifications	Maintenance team to take into account limitations in the programme	2	2	4	
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Phase	
C	Construction
M	Maintain/Clean
D	Demolish/Adapt

Hierarchy of Mitigation

1. Eliminate hazard - design out
2. Reduce risk at source - amend design
3. Provide risk information - add to design

Prepared by:	Team Badger	Date:	04 February 2021
Reviewed by:	Team Badger Internal	Date:	
Approved by:	Team Badger Internal	Date:	