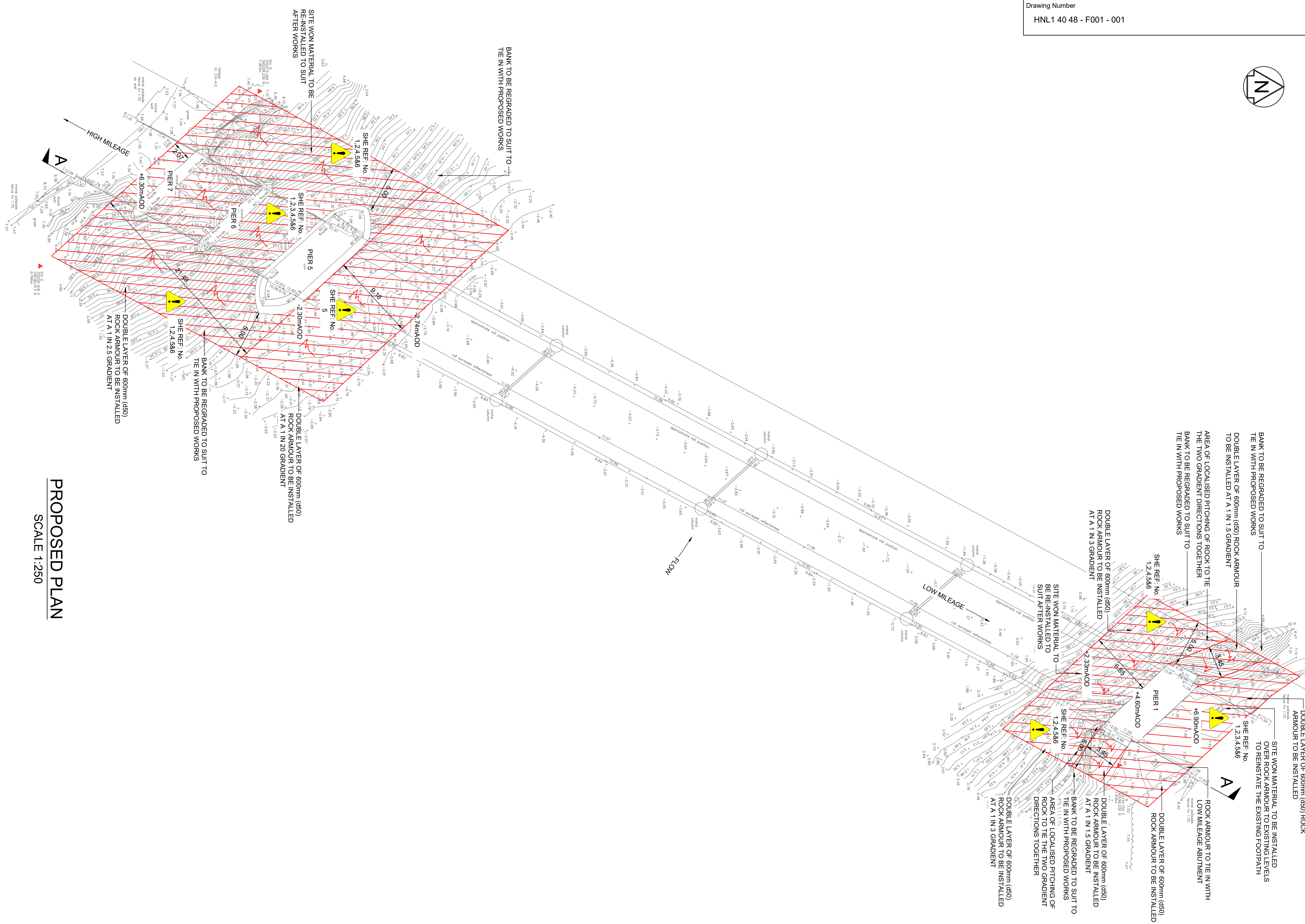
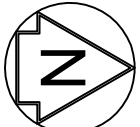




PROPOSED PLAN
SCALE 1:250

REQUIREMENTS FOR INSTALLATION OF ROCK ARMOUR.

- A. Rock armour size to be within the range and distribution set out in the technical specification. Specific stone size and grading information is tabulated on this drawing. Shape and other characteristics will be as defined in the technical specification.
- B. The rock armour to the specification defined above to form a minimum double layer such that each layer is keyed into one another.
- C. As an approximate guide, and due to the fact that some interlocking of the two layers takes place, the approximate thickness of a double layer of D50 stone can be calculated as such: $(2 \times d50) \times 0.9$. For the purpose of the construction, this thickness should be treated as a minimum.
- D. Under no circumstances will any excavations to place the rock armour at the base of the piers and abutments extend below foundation level. This is to ensure that undermining of the foundations does not take place.
- E. Trial holes must be undertaken at the base of all elements subject to scour protection works. The trial hole must extend to the proposed formation level and the findings should be reviewed by an engineer before undertaking further works.
- F. Maximum length of any excavation around the base of the piers to be no greater than 3m. This limit to the length of excavation is to reduce the risk posed to the structure in case of a sudden change to flow that would increase the short term risk from scour.
- G. No excavation to be left unattended or left open overnight. Each section of excavation to be fully protected with rock armour by the end of the working day.

SERVICES INVESTIGATION GAUGE.

DESK STUDY SEARCH ONLY

DESK STUDY AND GPR SURVEY

DESK STUDY AND TRIAL

HOLES

SCOUR SCORE:

EXISTING SCOUR SCORE (PR) = 17.03 - HIGH PRIORITY

SCOUR SCORE (PR) FOR PIER 1, PIER 5, PIER 6 & PIER 7 FOLLOWING INSTALLATION OF SCOUR PROTECTION = 10.00 - LOW PRIORITY

ANY MASONRY REPAIRS REQUIRED SHOULD BE CARRIED OUT IN ACCORDANCE WITH NETWORK RAIL STANDARDS. NETWORK RAIL CONTRACTOR TO INSPECT BRICKWORK/MASONRY AND PROPOSE REPAIR TO DESIGN CRE FOR CONFIRMATION AND NETWORK RAIL DPE FOR APPROVAL

SAFETY, HEALTH & ENVIRONMENTAL RISK ASSESSMENT		
NOTE: The designers risk documentation includes full details of the risks associated with this scheme.		
Hazard	Construction and Operation	Site Risk Mitigation
1. Installation of Rock	Installation to be carried out by trained and competent contractor. To be detailed in method statement. Adequate temporary works to be implemented. CAT scans and trial excavations to be carried out where required.	Appropriate working method to be identified in contractors method statement. Appropriate PPE to be worn at all times.
2. Unknown buried services		
3. Limited space available for construction		
4. Excavation	Excavation to be carried out by trained and competent contractor. To be detailed in method statement. Adequate temporary works to be implemented.	Extra care to be taken when excavating near elements.
5. Potential undermining of structure foundations		Excavation to be carried out in 1m bays. Structure to be continually monitored during the works in close proximity to foundations
Environmental		
6. Pollution hazards associated with working near a watercourse	Machines to be run on Bio-diesel. Refuelling of vehicles to be carried out within site compound.	
It is assumed that all works will be completed by a competent contractor and therefore all normal risks associated with construction works will be considered		

It is assumed that all works will be completed by a competent contractor and therefore all normal risks associated with construction works will be considered

Grading requirement of stone			
	d0 / M0 (Minimum stone size)	d50 / M50 (Average stone size)	d100 / M100 (Maximum stone size)
Size (mm)	420	600	820
Weight (kg)	185	540	1378
Minimum properties of stone			
Test	Reference BS	Unit	Value
Oven Dry Particle Density (min)	BS EN 13383-2	1m³	2.5
Apparent Particle Density (min)	BS EN 13383-2	1m³	2.52
Water Absorption (WA) (max)	BS EN 13383-2	%	2.0
Compressive Strength Category	EN 1926	-	CS#
Resistance to wear: Micro-Deval Co-efficient (Mde) (max)	BS EN 1097 Part 1	-	10-30
Resistance to fragmentation: Los Angeles test (LA) (max)	BS EN 1097 Part 2	%	<25
Magnesium Sulphate Soundness (max)	BS EN 1367-2	%	10
Freeze-Thaw Loss: (max)	BS EN 13383-2	%	1.0

F001 DESIGN		
CRE	PROJECT ENGINEER	ASSET ENGINEER



UPSTREAM ELEVATION

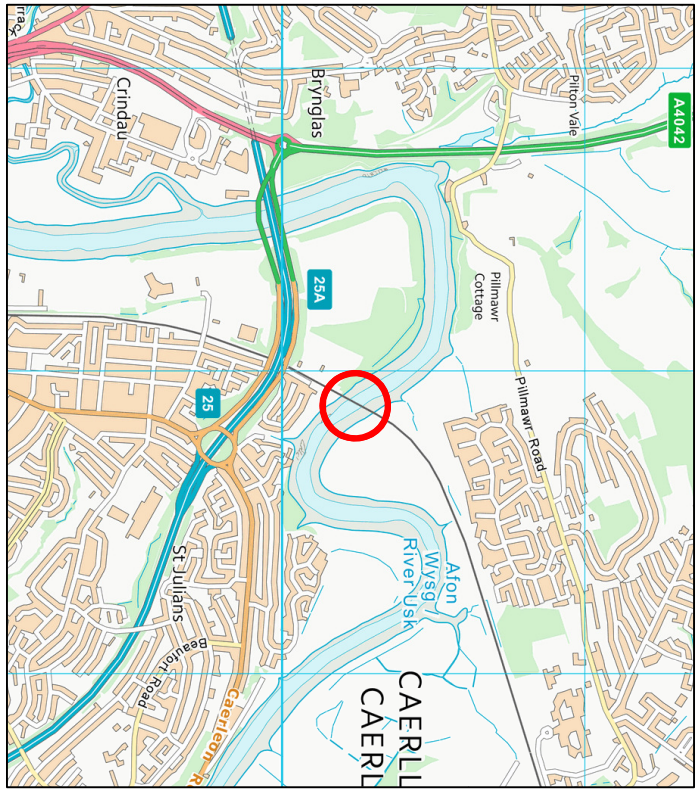


DOWNSTREAM ELEVATION



Our Lifesaving Rules

- All dimensions shown are in metres unless otherwise stated and levels in metres to a local datum.
- Do not scale from this drawing. All dimensions must be checked/verified on site.
- Any discrepancies noted on site are to be reported to the Engineer immediately.
- All works in watercourses will be carried out with care to minimise the risk of pollution.
- All works affecting flood defences, main watercourses and/or drainage systems must be carried out in accordance with the Flood and Drainage Act 1991.
- The locations of any known services shown on drawing are approximate and for guidance only. The Contractor will confirm the location of any services prior to the commencement of any works.
- The electronic model of this drawing is not to be used for setting out.
- All mileages shown on drawing are approximate.
- Survey information collected by Anthony Brookes Surveys on behalf of Dyer & Butler.



LOCATION PLAN
SCALE 1:2500

Key

Existing or unchanged

Modified or to be moved

Redundant or to be removed

New, proposed or additional

SR RCB

IF SR RCB

PW SR RCB

CHD SR RCB

APR SR RCB

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
A03	16/09/19	Following Comments	IF	SR	RCB
A02	10/09/19	Following Comments	IF	SR	RCB
A01	15/03/19	Form 001 Design	PW	SR	RCB
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

Status

F001



Network Rail
17 Peachtree House
17 Peachtree Road
City of London
EC1A 3DF

Contractor

Consultant



JBA Consulting
The Old School House
St Julian's Street
LS24 9HA
Tel: 01837 837900

Scour Protection Design
HNL 1 40 48
St Julian's, Newport

Drawing Title

HNL 1 40 48 - Scour Protection Design
Proposed Plan

Designed	P Whitwell	Signed	P Whitwell	Date	22/03/19
Drawn	P Whitwell	Signed	P Whitwell	Date	22/03/19
Checked	S Riddellstone	Signed	S Riddellstone	Date	22/03/19
Approved	R Buck	Signed	R Buck	Date	22/03/19
Scale(s)	AS SHOWN @ A1	ETR & Mileage	HNL 1 40m 1056yds	Sheet	1 of 1
Alternative Reference					
Drawing Number	HNL 1 40 48 - F001 - 001	Revision	A03		