

# Sevenacres Weir Barrier to Fish Migration

## Works Information and Site Information

Client: Ayrshire Rivers Trust

Reference: WATPB6282R002F1.0

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Classification

Project related



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## Table of Contents

<b>1</b>	<b>Works Information</b>	<b>7</b>
1.1	Description of the Works	7
1.2	Drawings	7
1.3	Specifications	8
1.4	Constraints on how the Contactor Provides the Works	8
1.4.1	General	8
1.4.2	Completing Activities and the works	8
1.4.3	Access	9
1.4.4	Ecology	9
1.4.5	Working Dates Constraints	9
1.4.6	Underground and Overhead Services	9
1.4.7	Health and Safety	9
1.4.8	Pollution Prevention	10
1.5	Requirements for the programme	10
1.6	Service and other things provided by the Employer	10
1.6.1	Principal Designer	11
<b>2</b>	<b>Site Information</b>	<b>12</b>
2.1	Site Access	12
2.2	Site Ownership	12
2.3	Site Compound	12
2.4	Site Ecology	12
2.5	Site Geology	13
2.6	Ground Investigation	13
2.7	Site Topography	14
2.8	Underground and Overhead Services	14
2.9	UXO	14
2.10	River Flows	15
2.11	Adjacent Buildings/Land Use	15
2.12	Health and Safety Risks	15

<b>3</b>	<b>Specification</b>	<b>16</b>
	<b>SPECIFICATION PART A - GENERAL</b>	<b>16</b>
	<b>SPECIFICATION PART B</b>	<b>17</b>
	<b>PART 1 – SUPPLEMENTARY CLAUSES</b>	<b>17</b>
	<b>SECTION 1 – GENERAL</b>	<b>17</b>
1.1	DEFINITIONS	17
1.2	ACCOMMODATION FOR THE CONTRACT	17
1.5	TIDINESS OF SITE	18
1.6	ENTRY ONTO THE SITE	19
1.7	SURVEY OF HIGHWAYS, PROPERTIES AND LANDS	19
1.8	LEVELS AND REFERENCE POINTS	19
1.9	TEMPORARY SITE FENCING AND GATES	20
1.10	INTERFERENCE WITH LAND INTERESTS	20
1.11	INTERFERENCE WITH ANY ACCESS TO PROPERTY, APPARATUS OR SERVICE 20	
1.13	PROTECTION AGAINST DAMAGE	21
1.15	WORKS AFFECTING WATERCOURSES	21
1.17	APPARATUS OF STATUTORY UNDERTAKERS, HIGHWAYS OR ROADS AUTHORITY AND OTHERS	21
1.18	TRAFFIC REQUIREMENTS	22
1.19	EMERGENCY ARRANGEMENTS	22
1.25	REINSTATEMENT OF SITE	22
1.26	RECORDS	22
1.27	TEMPORARY SERVICES	23
1.28	TEMPORARY WORKS	23
1.29	PROGRAMME OF WORKS	23
1.30	WORKING HOURS	23
1.31	PUBLICITY AND RELEASE OF INFORMATION	23
1.32	HEALTH AND SAFETY	24
1.33	CDM REGULATIONS	24
1.34	ENVIRONMENTAL BEST PRACTICE	24
1.35	AS CONSTRUCTED DRAWINGS	25
1.36	LICENSES AND CONSENTS	25
1.37	REDUCTION OF NOISE	25
1.38	REDUCTION OF DUST	26

<b>1.39 CONTROLLED WASTE – DUTY OF CARE</b>	<b>26</b>
<b>1.40 SITE SECURITY</b>	<b>26</b>
<b>1.41 LIASON WITH THE PUBLIC</b>	<b>26</b>
<b>1.42 REPORTING</b>	<b>26</b>
<b>1.43 CONTAMINATION</b>	<b>27</b>
<b>1.44 LIGHTING OF FIRES</b>	<b>27</b>
<b>1.45 EXPLOSIVES</b>	<b>27</b>
<b>1.46 SCHEME SIGNBOARD</b>	<b>27</b>
<b>1.47 VIBRATION</b>	<b>27</b>
<b>1.48 TREE PRUNING AND FELLING</b>	<b>28</b>
<b>SECTION 2 - MATERIALS SPECIFICATION</b>	<b>29</b>
<b>2.4 AGGREGATES FOR CONCRETE</b>	<b>29</b>
<b>2.20 CONCRETE– GENERAL</b>	<b>29</b>
<b>2.22 CONCRETE– READY MIXED</b>	<b>30</b>
<b>2.50 GENERAL FILLING MATERIALS</b>	<b>30</b>
<b>2.56 GRASS SEED</b>	<b>30</b>
<b>2.60 HANDRAILING AND BALUSTERS</b>	<b>30</b>
<b>2.62 IMPORTED TOPSOIL</b>	<b>31</b>
<b>2.89 PERMANENT FENCING</b>	<b>31</b>
<b>2.120 STEEL REINFORCEMENT</b>	<b>31</b>
<b>2.143 GEOTEXTILE</b>	<b>31</b>
<b>2.144 ANCHORS / DOWELS TO ROCK BED</b>	<b>32</b>
<b>2.146 ROCK ARMOUR</b>	<b>32</b>
<b>2.147 STEEL LARINIER FISH PASS BAFFLES</b>	<b>33</b>
<b>2.149 SECURITY SCREENS</b>	<b>33</b>
<b>2.150 STOP LOGS</b>	<b>34</b>
<b>2.151 OPEN MESH FLOORING</b>	<b>34</b>
<b>2.152 CONCRETE ACCESS STEPS</b>	<b>35</b>
<b>2.153 ACCESS LADDER</b>	<b>35</b>
<b>SECTION 3 – EXCAVATION, BACKFILLING AND RESTORATION</b>	<b>36</b>
<b>3.1 EXCAVATION</b>	<b>36</b>
<b>3.6 BACKFILLING</b>	<b>36</b>
<b>3.9 REINSTATEMENT OF UNPAVED LAND</b>	<b>37</b>
<b>3.16 DEMOLITION</b>	<b>37</b>
<b>2. The Contractor shall minimise the extent of the local demolition of the existing weir as far as practicable and adopt a suitable working methodology to minimise risk to the</b>	

structural integrity of the remaining weir structure (in both temporary and permanent cases). 37

3. The new works shall be structurally tied (e.g. through drilling and fixing of dowels) into the remaining section of the existing weir to provide stability to the existing structure. The joint/interface between the new and existing structure is to be watertight to the crest height of the existing weir. 37

3.17 TEMPORARY WORKS 37

3.18 DISPOSAL OF EXCAVATED/SURPLUS MATERIAL 37

3.19 CONTAMINATED LAND 38

3.20 LANDSCAPING 38

## **SECTION 4 – CONCRETING AND FORMWORK 39**

4.1 SUPPLY OF INFORMATION 39

4.3 IDENTITY TESTING 39

4.5 TRANSPORTING, PLACING AND COMPACTING 40

4.8 CURING 40

4.9 RECORDS OF CONCRETING 40

4.10 CONSTRUCTION OF FORMWORK 40

4.12 STRIKING OF FORMWORK 41

4.16 SURFACE CONDITION OF REINFORCEMENT 41

4.22 SURFACE FINISHES PRODUCED WITH FORMWORK 41

4.25 TOLERANCES FOR CONCRETE SURFACES 41

4.29 REMEDIAL TREATMENT 42

### **Table of Tables**

Table 1 - Drawings relevant to this contract. 7

Table 2 - Specifications relevant to this contract. 8

Table 3 - Daily flows on Sevenacres Weir. 15

Table 4 - Estimated Flows over Sevenacres Weir during flood flows. 15

## **Appendices**

**Appendix A - Drawings**

**Appendix B – CDM Hazard Log**

**Appendix C – Topographic Survey (March 2016)**

**Appendix D – Utilities Search (February 2016, December 2017)**

**Appendix E – Ecological Survey Reports (March 2016 & April 2018)**

**Appendix F – Geotechnical Desk Study (March 2016)**

**Appendix G – Ground Investigation Report (June 2017)**

**Appendix H – Pre-Construction Information (PCI)**

**Appendix I – Buildability Report**

**Appendix J – Soil Analysis (April 2018)**

**Appendix K - Licenses**

## 1 Works Information

### 1.1 Description of the Works

The project is located on the Lugton Water River, 3.5km E-NE of Kilwinning. Approximate OS Grid Reference NS 33454 44324.

The works consist of the construction of a Lariner fish pass along the right bank of the Lugton Water River to provide passage to Migratory Salmonids and Non-Migratory Trout past the Sevenacres Weir. This will include ground investigation work to confirm bedrock level in the river channel, installation of temporary works to divert river flows and create a dry working area , breaking out of existing weir locally in area of proposed works, excavation of the river bank and bed, construction of reinforced concrete base and walls of fish pass, placing of rock armour scour protection to bed and banks, installation of fish pass baffles within reinforced concrete channel, backfill and reinstatement of area, including the installation of security screens, open-mesh walkway, access steps, guardrails and fencing. Pending outcome of further survey/investigation, remedial work may also be required to the existing mass concrete weir at the tie-in with the left bank.

### 1.2 Drawings

The drawings relevant to this contract are tabled below and included in **Appendix A**:

Drawing Number	Title
PB6282/1000	SITE LOCATION PLAN AND UTILITIES INFORMATION
PB6282/1010	GENERAL ARRANGEMENT
PB6282/1011	FISH PASS ARRANGEMENT AND SECTIONS
PB6282/1012	SECTIONS (1 of 3)
PB6282/1013	SECTIONS (2 of 3)
PB6282/1014	SECTIONS (3 of 3)
PB6282/1015	DETAILS
PB6282/2000	FISH PASS ARRANGEMENT AND SECTIONS RC DETAILS
PB6282/2001	SECTIONS – RC DETAILS
PB6282-2000-2001-Sched 01	BAR SCHEDULE
PB6282-2000-2001-Sched 02	BAR SCHEDULE

Table 1 - Drawings relevant to this contract.



### 1.3 Specifications

Specifications relevant to the contract are tabled below;

Title	Date of Revision	Publicly Available
Civil Engineering Specification for the Water Industry 7th Edition (CESWI)	March 2011	Yes
Sevenacres Works Information and Site Information supplementary clauses	-	Refer to Section 3

Table 2 - Specifications relevant to this contract.

### 1.4 Constraints on how the *Contractor* Provides the Works

#### 1.4.1 General

The following are general constraints upon the *Contractor*:

- The *Contractor* must provide 7 days' notice before any works are to commence on site;
- The *Contractor* shall provide a pollution prevention method statement including sediment/silt management plan for approval by the *Contract Administrator* prior to work commencing;
- The *Contractor* will ensure that all activities, including traffic management, in providing the works will meet the requirements of the Planning, highway and Police Authorities;
- The *Contractor* shall comply with utility companies and private industry current terms/conditions, safety procedures and permit conditions;
- The *Contractor* shall provide an 'out of hours' contact to the Employer for emergency standby purposes;
- The *Contractor* shall make available key individuals for weekly progress meetings or as required by the Employer;
- The existing defence level should be maintained at all times during the construction of the works. The *Contractor* shall provide a detailed method statement on how this will be achieved for approval by the *Contract Administrator* prior to work commencing;
- The *Contractor* shall comply with all the constraints identified in Section 1 of the Specification; and
- Site working hours shall fall within 0730 and 1800 on weekdays. No working on weekends and public holidays.

#### 1.4.2 Completing Activities and the works

The works are not considered complete until:

- All items in the Price List are complete (unless omitted by instruction of the Employer);
- Site compounds are cleared and working areas reinstated; and
- The information required by the client to update the Health & Safety File and a complete set of marked up 'As-Constructed' drawings are provided by the *Contractor*.

### 1.4.3 Access

- Access to the site is via narrow country roads which may reduce the size of plant that can be brought to site. Refer to the Site Information and provided drawings for further description of the access routes.
- The access road throughout the Sevenacres Bridge hamlet surrounding the works is to remain open and accessible at all times to members of the public.
- An 18t m.g.w. restriction is in place on Sevenacres Mill Bridge on the southern approach to the site.
- North Ayrshire Council are intending to repair/replace Sevenacres Mill Bridge in 2019.

### 1.4.4 Ecology

An ecology visit was undertaken as part of the design phase and additional information on protected species is available in the Sevenacres Weir Ecological Report (March 2016) included in **Appendix E**.

A pre-construction otter survey was carried out in May 2018 (included in **Appendix E**). No holts or resting places were recorded within 200m of the site, however evidence indicated otters use the area to forage and commute. No protected species license is required; however, the *Contractor* shall include a species protection plan detailing the mitigation measures to be applied with reference to the recommendations in the ecological report and pre-construction otter report.

Constraints:

- The main impact on ecology is likely to be impacts on nesting birds during construction. Any vegetation removed should be checked by a trained ecologist for nesting birds.
- No works will take place on the left bank upstream of the site which is believed to be good habitat for water voles, though no voles were found during the ecology visit.

### 1.4.5 Working Dates Constraints

It is anticipated that construction will be scheduled to take place in Summer months when river flows are low in order to minimise the risk of high flows/river levels impacting on the works.

### 1.4.6 Underground and Overhead Services

Desk based service searches have been undertaken and the results are included in the Site Information. The *Contractor* will consider the following constraints:

- On the access roads, there are overhead power lines and these need to be considered particularly when bringing large loads or plant into the site.
- An electricity cable, which previously fed the now demolished barn, ran within the site area.
- A water supply which previously fed the now demolished barn, ran within the site area.

### 1.4.7 Health and Safety

- The *Contractor* will undertake the *works* in accordance with all current Health and Safety regulations.
- The *Contractor* will be the Principal Contractor in terms of The Construction (Design and Management) Regulations 2015.

- The *Contractor* is to contribute to the development of the Health and Safety File and fulfil his designated role under the CDM Regulations and provide as-constructed drawings.
- The *Contractor* will provide their Construction Phase Plan, Risk Assessments and Method Statements to the *Employer* for comment two weeks prior to commencing on site.

#### 1.4.8 Pollution Prevention

The *Contractor* will follow pollution prevention best practice throughout the construction phase to ensure that pollution risk to the water, land and air environment are minimised.

The *Contractor* will adhere to the requirements of SEPA's Pollution Prevention Guidelines, recently renamed Guidance for Pollution Prevention (PPG/GPP), in particular PPG1 Understanding your environmental responsibilities - good environmental practices, GPP5 Works or maintenance in or near water, PPG 6 Working at construction and demolition sites, GPP 21: Pollution incident response planning and PPG 22: Incident response - dealing with spills.

The *Contractor* shall produce a sediment/silt management plan.

As a minimum, the *Contractor* will implement the following measures to minimise and control potential environmental risks:

- Site induction for all operatives and visitors;
- Tool-box talks on environmental issues to be given to operatives;
- Oil spill kits to be kept on site at all times;
- Emergency response plan to be put in place and communicated to all site staff;
- Workforce trained in the use of the spill kits and implementation of the emergency response plan;
- Re-fuelling of mobile plant will take place away from the river and any drainage systems on site;
- All plant used on site will be in good condition, and free from oil and fuel leaks (biodegradable hydraulic oils will be used where feasible);
- All static plant will be fitted with drip trays; and
- All waste will be disposed of in compliance with current guidelines and legislation.

### 1.5 Requirements for the programme

The *Contractor* shall deliver the works:

- Starting no earlier than TBC.
- Completing the works by the 31<sup>st</sup> October 2018.

The *Contractor* will provide a Clause 31 programme with their submission.

- The *Contractor* arranges the programme and provides it to the *Employer*.
- The programme will be updated by the *Contractor* on a bi-weekly basis.

### 1.6 Service and other things provided by the Employer

- The *Employer* will provide a CAR licence for the works.
- The *Employer* will provide Planning Consent for the works.

The *Contractor* will comply with any conditions associated with the CAR Licence and Planning Consent.



### 1.6.1 Principal Designer

The *Employer* will provide a Principal Designer, under the CDM(2015) Regulations.

The Principal Designer will be Royal HaskoningDHV.

The contact details are:

- Steve Vernon
- Steve.Vernon@rhdhv.com
- 0113 360 0536

## 2 Site Information

### 2.1 Site Access

The site access is reasonable with roads directly to the site. However, the roads are smaller country roads that would be unsuitable for larger construction traffic and this should be considered during planning of the construction phase. The access road from the south crosses a small bridge adjacent to the site and the *Contractor* should undertake an assessment and plan work accordingly.

From the south, the site can be approach by using the A78 north towards Kilwinning, exiting onto Irvine road and then onto the B785. After 1.8mile on the B785, at North Fergushill Farm, the route leaves the B785 and goes onto smaller country roads heading north for approximately 0.8miles. This route crosses a rail bridge and goes under high voltage electricity pylons. There are also telephone cables that cross the road.

An alternative route from the north is as follows. Follow the A737 south to Kilwinning and exit the town onto the B778 heading north-east. A right turn to exit the B778 is required, near Dykeneuk Farm, at the first cross roads head right towards Clonbeith Farm and follow the road for approximately 1 mile, before turning left. Follow this road 0.5 miles to reach the site. Telephone cables run adjacent to the road but do not appear to cross. The roads are quite narrow, but the verge is generally wide, leaving ok access for construction vehicles.

The drawings developed during the design phase include a utilities search which highlight where services cross the access routes.

Site boundaries and location of works are shown on drawing number **PB6282-1000**.

### 2.2 Site Ownership

The site, weir and access are owned by Ian Anderson. Communication with the land owner is to be via the *Employer*.

### 2.3 Site Compound

The site previously contained a derelict barn structure which has now been demolished to ground level. The foundations of the barn and the hardstanding of the floor remain. The benefit of using the demolished barn area is that it is believed that the hardstanding concrete base of the barn may provide a suitable surface for the positioning of site cabins and material storage areas. The right bank of the river can be accessed directly from the former barn site. It may also be possible to make temporary use of an area of land immediately to the south west of the former barn. Ground levels in this area are lower (varying from 1m to 2m) than the former barn and a concrete blockwork retaining wall separates the two areas. The location of the Site Compound is shown on drawings PB6282-1000 & 1010.

### 2.4 Site Ecology

An ecology visit was undertaken as part of the design phase and additional information on protected species is available in the Sevenacres Weir Ecological Report (March 2016), in **Appendix E**.

In summary, the following ecological risk were identified:

- Otter: the pre-construction otter survey did not identify any active holts or resting places. Evidence indicated that otters occasionally use the left-hand bank to circumnavigate the weir when moving up and downstream and the *Contractor* shall put in place appropriate mitigation measures.
- Water vole: the reed bed on the left bank immediately upstream of the weir is assessed as sub-optimal habitat for water vole, based on the site survey and findings of previous survey (undertaken at a time when the left bank could be accessed). It is concluded that water vole are highly unlikely to be present in this area due to the lack of suitable burrowing habitat.
- Nesting birds (especially kingfisher/ osprey): the survey was undertaken outside of bird nesting season, however, there are no high sandy banks near the weir suitable for kingfisher to nest in, and the tree habitat is not suitably open for nesting osprey. Other common bird species were identified on site and there is potential that these could be nesting in trees and shrubs near the weir during construction.
- Bats: no evidence of roosting bats was found during the survey, however, bat boxes and mature trees suitable for bat roosting were identified near the weir site, particularly along the left bank and at the inside of the downstream meander bend (right bank).

The main impacts on ecology are likely to be limited to impacts on otter and nesting birds during construction, which can be managed through a series of best practice measures discussed further in the ecology report but including:

- Removing vegetation on the right bank prior to construction, ideally before nesting bird season (mains season is May, June and July but birds can be nesting between February and August), or if this cannot be done then employ a qualified ecologist to survey the vegetation within 24 hours before undertaking clearance works (and if nests are found, identify an alternative approach to undertaking the planned works to avoid disturbance). Trees on the right bank were cut down to 1m above ground level in April 2018.
- Undertaking a standard pre-construction survey by a qualified ecologist within three months prior to the start of construction works, and when river levels are low, to check whether there is evidence of otter actively using the site for resting (holt or couch). If a holt is identified under these conditions, then either a buffer zone of 30m around the holt is required or a European Protected Species licence will need to be obtained from Scottish Natural Heritage.

Environmental Clerk of Works services are to be provided by the Ayrshire Rivers Trust.

## 2.5 Site Geology

Geological maps of the site indicate a sill of igneous rock (dolerite) is present at ground surfaces at the site, thrust between the surrounding rock strata of the Lower Coal Measures of Carboniferous age. The maps indicate that a main coal seam outcrops at the site, as well map published by the Coal Authority indicate that the site is located close to a zone defined as “Development High Risk Areas”, and the map show three known mine entries within the vicinity of the site.

A geotechnical desk study report undertaken in March 2016 is included in **Appendix F**.

## 2.6 Ground Investigation

An intrusive ground investigation was undertaken by SKF Ltd on the 19th and 20th June 2017. The ground investigation consisted of the following:

- 1 no. borehole through the existing weir drilled to a depth of 3.0m.

- 6 no. machine excavated trial pits located along the top of the river bank to a maximum depth of 3.0m.
- Sampling of the encountered soil and rock with associated geotechnical and geo-environmental laboratory testing. The geotechnical laboratory testing was undertaken by MAT Test Ltd and the geo-environmental laboratory testing was undertaken by DETS.

A copy of the factual report in addition to a summary report is included in **Appendix G**.

## 2.7 Site Topography

Topographic and river cross section survey was undertaken by Aspect Land and Hydrographic Surveys Ltd. on 17<sup>th</sup> March 2016. A copy of the survey report is included in **Appendix C**. Copies of the survey are available electronically.

## 2.8 Underground and Overhead Services

Desk based service searches were undertaken in February 2016 and December 2017. The results of this search are included on drawings, with data included in **Appendix D**. It is recommended that a service search is updated within three months, as a maximum, of the planned start of construction.

There are two high voltage electrical cables indicated on or near the site, one runs within the road along the western edge of the site and the second runs from the north-west onto site where it supplied the former barn structure.

A water main runs in the road and it is understood that a previous connection to the former barn is buried adjacent to the electricity cable. Both services are understood to be capped on site, however should be considered as live until proven otherwise.

On the access roads there are overhead power lines and these need to be considered particularly when bringing large loads or plant into the site.

## 2.9 UXO

There is some history of military presence in the local area, although the UXO risk can be generally categorised as low risk based on the Zetica open source data for South West Scotland (accessed February 2018). However, it should be noted that there may be some UXO hazards that have not been identified and there is a therefore a residual risk during works. The official data is also likely to underrepresent actual bombing



## 2.10 River Flows

There is no flow data available for this site. Estimates for daily river flows were calculated during the design stage and are shown in the table below:

Low Flow %	Estimated Flow at weir (m <sup>3</sup> /s)	Average Depth of Flow over Weir (m)
95	0.08	0.03
70	0.33	0.07
50	0.55	0.09
10	3.41	0.31

*Table 3 - Daily flows on Sevenacres Weir.  
A flow of 95% is a flow that is exceeded on 95% of days during a year.*

Estimates for flood flows were calculated during the design stage:

Return Period (years)	Estimated Flow at weir (m <sup>3</sup> /s)	Average Depth of Flow over Weir (m)
2	37.92	1.57
10	56.16	2.04
200	96.47	2.92
200+CC	115.76	2.09

*Table 4 - Estimated Flows over Sevenacres Weir during flood flows.*

## 2.11 Adjacent Buildings/Land Use

The site is located within a small hamlet. The properties are generally residential, however the property adjacent to the site to the Southeast is a residential care home for young people (Millholm). A stables building is located to the West of the site.

## 2.12 Health and Safety Risks

Additional design information to support the *Contractor* can be found in the Construction Design and Management Regulations 2015 (CDM) hazard log provided in **Appendix B**. The CDM hazard log provides a list of risks and decisions undertaken at the design stage to reduce health and safety risks along with suggested mitigation measures for residual risks. The significant residual health and safety risks identified at this stage are also highlighted on the SHE boxes on the drawings in **Appendix A**. The residual risks described do not generally address the common place site hazards that must be addressed by the application of good site management practices.



### 3 Specification

#### **SPECIFICATION PART A - GENERAL**

##### **Standard Specifications and Clauses**

- 1 The specification referred to in this Works Information is the Civil Engineering Specification for the Water Industry, 7<sup>th</sup> Edition”, published by the UK Water Industry Research Ltd in March 2011 and the augmented by the Supplementary Clauses contained within this document.
- 2 In so far as any Supplementary Clause may conflict, or be inconsistent, with any provision of the ‘Civil Engineering Specification for the Water Industry, 7<sup>th</sup> Edition’ the Supplementary Clause shall always prevail.
- 3 Where the supplementary Clause replaces the existing Clause, the supplementary Clause will be denoted by the suffix “S” at the start of the Clause number.

## SPECIFICATION PART B

### PART 1 – SUPPLEMENTARY CLAUSES

#### SECTION 1 – GENERAL

##### 1.1 DEFINITIONS

7. To be consistent with the term used in the Civil Engineering Specification for the Water Industry, the term Contract Administrator has been maintained in the drafting of the supplementary clauses.

The list below identifies the relationships to the parties within the contract relating to approvals, permissions or instructions as follows:

**Contractor** – The Principal Contractor to whom the contract for the works has been awarded by the Client / Employer.

**Client / Employer** – The Ayrshire Rivers Trust, as represented by the Scheme Project Manager or other party as advised / delegated.

**Project Manager** – A Project Manager will be appointed by the Client to manage the NEC 3 Engineering and Construction Contract on their behalf, as notified under the contract, with delegated powers notified to the Contractor by the Client.

**Supervisor** – The Site Supervisor will act for the NEC Project Manager, as advised to the Contractor, with delegated powers notified to the Contractor by the Client or the NEC Project Manager.

**Contract Administrator** – As defined in the Civil Engineering Specification document, 7<sup>th</sup> Edition. The term Contract Administrator is used throughout the specification. For this project, this role will be split between the Project Manager and the Supervisor. The Project Manager will be responsible for the general management and administration of the contract. The Supervisor will support the Project Manager and act for him in site matters, specifically relating to quality, workmanship, approval of materials and alternative design proposals.

The Contractor should satisfy himself that roles and personnel relating to them are understood in relation to the references in the clauses. Should the Contractor at any point be unclear as to who is the responsible party for various approvals, permissions or instructions they should seek clarification from the Project Manager (or Client in his absence) at the earliest opportunity.

##### 1.2 ACCOMMODATION FOR THE CONTRACT

5. The location for the site compound is shown on drawing numbers **PB6282-1000 and 1010**. Before any temporary buildings are erected the *Contractor* shall submit to the *Contract Administrator* for approval a plan showing the proposed layout of the site within the designated area, the position of offices, conveniences, materials, storage area, etc.

6. The *Contractor* may propose alternative arrangements for the site compound and storage areas. However, these shall be to the approval of the *Contract Administrator*. For alternative arrangements, it shall be the *Contractor's* responsibility to negotiate, arrange, pay for and reinstate the areas.

7. On completion of the Contract, the *Contractor* shall return compound area/s, accesses, routes and any other affected areas to a condition not inferior to that pertaining at the commencement of the Contract. The *Contractor* shall obtain approval from the *Contract Administrator* for the scope and standard of restoration.

8. The *Contractor* shall provide space within a shared office with the *Contractor's* facilities for the Project Manager/Supervisor. This shall comprise:

- A suitable desk and chair;
- Use of a suitable separate kitchenette;
- Use of an equipment store;
- Shared toilet facilities;
- Lockable security shuttered windows; and
- Use of printer facilities.

9. All rooms shall have electric lighting and power points. The main entrance shall have a secure operational lock.

10. The *Contractor* shall supply consumables such as tea, coffee, paper towels, paper, stationery, etc

11. The Project Manager/Supervisor's accommodation shall be cleaned on a daily basis.

12. The *Contractor* shall provide, maintain and replace, where applicable, appropriate instruments and survey equipment for the Supervisor to check his/her setting out or to measure works in progress or completed. The instruments will remain the property of the Contractor.

13. The *Contractor* shall provide, maintain and replace, where applicable, appropriate Personal Protective Equipment (PPE) for use by the Project Manager/Supervisor during the duration of the works. PPE shall include, but not be limited to:

- Hard hat (for visitors);
- Ear protection;
- Eye protection;
- High visibility vest/anorak (for visitors);
- Steel toed and mid-soled safety shoes/boots; and
- Life jackets.

## **1.5 TIDINESS OF SITE**

5. The *Contractor* shall keep land adjoining the working site clear of spoil, spillages and debris arising from the site.

6. No rubbish or material may be burned on site.

7. The *Contractor* shall ensure that any materials, plant or tools which are used in areas which are subject to flooding shall be secured or removed from working areas at the end of each working day.

## 1.6 ENTRY ONTO THE SITE

6. All surrounding land is owned by Ian Anderson. Communication with the land owner is to be via the *Employer*.
7. The Site Access arrangements are detailed in Section 2.1 of the Site Information.
8. The *Contractor's* attention is drawn to the sensitivity of the use of local roads. The *Contractor* will be responsible for liaising with the Highways Authority, Council Planning Department, public utility companies and the police with regards to movement of plant and material on public highways and in the measures required for safe access and egress to and from the site.
9. The *Contractor* shall be responsible for any damage to existing roads, accesses, land, property or other works, caused by his operations.
10. The *Contractor* shall form, maintain and subsequently remove any materials, barriers and fencing required for the purpose of accessing the site in a safe manner and is responsible for keeping the access routes safe for other users where permitted/unavoidable. All such features should be removed on completion of the works or as instructed by the *Contract Administrator*.

## 1.7 SURVEY OF HIGHWAYS, PROPERTIES AND LANDS

Delete **sub-clause 1** and replace with:

**S1.** Prior to any work commencing on site, the *Contractor* shall undertake a condition survey with the *Contract Administrator* and agree and record the condition of the existing routes and works areas, which may be affected by his operations. The survey is to include the taking of photographic and video records of the condition of the existing watercourse, highways and land to record their existing condition. The results of the survey including photographs and measurements will be recorded, with one electronic copy being provided to the *Contract Administrator*.

**S2.** On completion of the Works the *Contractor* shall undertake a second joint condition survey with the *Contract Administrator* to determine and agree the extent of any damage which may have occurred. They shall then agree whether any alleged damage was caused or not caused as a result of the *Contractor's* operations. Particular attention shall be paid to the access route to the site. Both during the period of the works and at completion, any damage caused to road surfaces or verges by the vehicles of the *Contractor* or his suppliers is to be repaired immediately, at the expense of the *Contractor*.

## 1.8 LEVELS AND REFERENCE POINTS

2. The works datum level shall be Ordnance Survey Datum (Newlyn).
3. The *Contractor* shall, before commencing work, check, verify and satisfy himself as to the existing levels of the ground and existing structures and agree them with the *Contract Administrator*. Before any excavation or breaking out is commenced, the *Contractor* shall define, by appropriate means, the reference lines and levels for setting out the works. These markers shall be regularly checked for accuracy throughout the Contract and where any displacement has occurred due to fluvial action, vandalism, equipment movements, etc., shall be accurately reset in their former positions.
4. The *Contractor* notifies the *Contract Administrator* immediately of any discrepancies between the levels on site and those shown on the drawings.

5. The *Contractor* shall demonstrate the correct alignment and levels of the works to the satisfaction of the *Contract Administrator* by setting up and maintaining a network of primary reference control points throughout the construction period.

6. The level and reference points to be used in setting out the works shall be the control stations set up on site for the topographic survey by Aspect Land and Hydrographic Surveys in March 2016 (tabled below). Before commencing the works, the *Contractor* shall verify the coordinates and levels of these reference points (if they can still be located) against known reference points and shall provide confirmation to the *Contract Administrator*.

STATION	EASTING (M)	NORTHING (M)	LEVEL (M OD)	MARKER
1	233410.292	644336.115	36.722	38 x 7mm P-K Mag Nail & Washer
2	233399.317	644304.266	33.991	38 x 7mm P-K Mag Nail & Washer

### 1.9 TEMPORARY SITE FENCING AND GATES

5. The *Contractor* shall take all reasonable measures to prevent access by the public and animals at any time to the working area. The *Contractor* will have sole possession of the site. Site fencing should be of a sufficient standard to prevent the general public from entering the Site at all times.

6. The *Contractor* shall provide, maintain and remove on completion signs warning of the dangers of construction work. They shall be securely fixed in an appropriate prominent location. The information on the signs shall include emergency contact details. Location and sign details are to be agreed by the *Contract Administrator*.

7. Consideration must also be given to the protection of wildlife, such as badgers, otters etc. that may access the site along the river bank.

### 1.10 INTERFERENCE WITH LAND INTERESTS

4. Neither the carrying of fire-arms, fishing tackle, nor the keeping/bringing in of dogs (other than guard dogs) will be permitted within the limits of the Site.

5. No person shall reside on the Site without the prior approval of the Contract Administrator.

### 1.11 INTERFERENCE WITH ANY ACCESS TO PROPERTY, APPARATUS OR SERVICE

5. The Contractor shall be responsible for maintaining existing private access roads in a serviceable condition for regular users with as little disruption as reasonably possible.

6. The Contractor shall provide traffic management to safely accommodate users of private access roads at all times.

7. The Contractor shall inform all local residents of the works in-writing, well in advance of the construction phase commencing. The information provided will contain a programme of works, contact details for a suitable person in case of complaint and proposed times of works during weekdays and weekends.

### **1.13 PROTECTION AGAINST DAMAGE**

4. The Contractor shall submit to the *Contract Administrator*, full details of all measures, such as temporary fencing or similar means of enclosure, to demarcate defined working areas for construction activity and/or protect adjacent structures, vegetation and trees and obtain approval in writing before commencing work in these areas. The details shall include arrangements, where proposed to protect any vegetation including trees to be lifted and re-planted during construction works.

### **1.15 WORKS AFFECTING WATERCOURSES**

6. A Controlled Activities Regulations (CAR) licence will be obtained by the *Employer*. The schedule for the engineering activity undertaken under this contract will be transferred to the *Contractor* in advance of commencing works and will be surrendered at the end of the works period. There are no application fees associated with either the transfer or the surrender application process.

7. The *Contractor* shall obtain approvals, design, supply, construct, maintain and afterwards remove, with consequent reinstatement to the satisfaction of the *Contract Administrator*, all necessary temporary works.

8. Full details of temporary works shall be submitted to the *Contract Administrator* for approval a minimum of one week before work commences. The design of temporary works shall not exacerbate the risk of flooding elsewhere.

9. The existing flood defence level shall be maintained at all times during the construction of the works. The *Contractor* shall provide a detailed method statement on how this will be achieved for approval by the *Contract Administrator* prior to work commencing.

10. Prior to commencing construction work, the debris and sediment accumulated upstream of the berm is to be removed from the channel and taken off-site for disposal. The debris comprises a variety of materials including a refrigerator, metalwork and plastic in addition to natural material (tree trunks and branches).

11. The *Contractor* shall notify the *Contract Administrator* immediately on discovery of any pollution incidents during the works.

### **1.17 APPARATUS OF STATUTORY UNDERTAKERS, HIGHWAYS OR ROADS AUTHORITY AND OTHERS**

5. Information from statutory undertakers is provided in the Site Information. However, no warranty is given for this information and the *Contractor* is not relieved of any of his obligations under the contract.

6. If any unidentified privately-owned service for water, electricity, drainage etc, passing through the site is affected by the Works, the *Contractor* shall locate it and provide an alternative service to the satisfaction of the utility owner and the *Contract Administrator* before cutting the existing service.

7. Should any unidentified service be found to exist, the *Contractor* shall at once give written notification to the *Contract Administrator* and shall be responsible for making all arrangements for diversion, support and protection as otherwise required by this clause.

#### **1.18 TRAFFIC REQUIREMENTS**

12. All access routes used by the *Contractor* shall be marked with direction signs and route arrows in accordance with any special requirements of the Highway Authority or private owner over whose land the route passes. The *Contractor* shall design, construct and maintain all such requirements. Sign and route arrows shall be removed at the end of the Contract.

13. The *Contractor* is responsible for communicating any dedicated route identified for delivery to site, routes to be avoided and routes that have access restrictions including main routes affected due to flood damage, to the drivers/companies engaged in the works or deliveries there to.

14. The *Contractor* shall obtain and pay for all licences and road closure orders required to undertake the works from the Highway Authority.

15. The *Contractor* shall obtain and pay for all necessary consents and licences required for the temporary works from the Highway Authority.

#### **1.19 EMERGENCY ARRANGEMENTS**

3. The *Contractor* shall provide the *Contract Administrator* with a least two telephone numbers at which responsible representatives of the *Contractor* can be contacted at all times outside normal working hours. One of these telephone numbers should be that of the Site Agent.

**Insert the following clauses:**

#### **1.25 REINSTATEMENT OF SITE**

1. On completion of the Contract, the *Contractor* shall return the working area, access, roads and embankments and any other affected areas to a condition not inferior to that pertaining at the commencement of the contract.

#### **1.26 RECORDS**

1. The *Contractor* shall take sufficient coloured photographs to record the condition of the site, before any plant or equipment arrives on site. A final set shall be taken on completion showing the finished works. Each set of photographs shall be numbered, dated and titled and a copy supplied to the *Contract Administrator* digitally.

2. The *Contractor* shall provide the *Contract Administrator* with progress photographs to be taken; a) within the week prior to the date of starting the Works on site, b) at weekly intervals and c) on completion.

3. All photographs shall be date marked and taken with a digital camera at locations directed by the *Contract Administrator*. Photographs shall have a quality of no less than 4 million pixels.



4. A copy of the photographs shall be supplied to the *Contract Administrator* digitally.

#### **1.27 TEMPORARY SERVICES**

1. The *Contractor* shall obtain all necessary approvals, comply with the relevant utility authority's requirements, provide and pay for all temporary services he may require.

2. Upon completion of the works, the *Contractor* shall remove all temporary services.

#### **1.28 TEMPORARY WORKS**

1. The *Contractor* shall obtain approvals, design, supply, construct, maintain and afterwards remove, with consequent reinstatement to the satisfaction of the *Contract Administrator*, all necessary temporary works. Full details of temporary works shall be submitted to the *Contract Administrator* for approval a minimum of one week before work commences.

2. All temporary works shall be properly designed and constructed to carry such loads as will be imposed upon them.

3. Materials intended for permanent use in the Works shall not be employed for temporary purposes during the construction of the Works except with the *Contract Administrator's* written approval. If the materials are used, then any damage resulting from such use shall be made good at no extra expenses to the Contract and to the satisfaction of the *Contract Administrator*.

#### **1.29 PROGRAMME OF WORKS**

1. The *Contractor* shall ensure through planning and programming of the works that the existing structures that are to remain in place are not damaged or de-stabilised when the new works are constructed. Where pedestrian access is required across the existing weir the *Contractor* should make a condition assessment and propose suitable measures to remove the risk of damage or de-stabilisation. No vehicular access is permitted over the weir.

#### **1.30 WORKING HOURS**

1. Working hours will be;

- a) For all Works; 7.30am to 6.00pm Monday to Friday.
- b) No working at weekends or Bank Holidays.

Working outside these times will not be permitted except during an emergency or as agreed with the *Contract Administrator*. "Working" includes pre-work activities where noise or nuisance is created, e.g. starting pumps, operating machinery, reversing vehicles (where fitted with warning siren) etc.

#### **1.31 PUBLICITY AND RELEASE OF INFORMATION**



1. The written permission of the Employer must be obtained before any information concerning the works can be published. The *Contractor* shall be responsible in this matter for the actions of his own employees, sub-contractors and suppliers.

### **1.32 HEALTH AND SAFETY**

1. The *Contract Administrator* shall be entitled to inspect all registers, reports and certificates which the *Contractor* is required by Law to keep and issue in respect of Safety matters and accidents.

2. In all places where there is a danger of workmen, or persons having business on or visiting the site, falling into the watercourse, suitable rescue equipment shall be kept ready for use and maintained in good condition.

### **1.33 CDM REGULATIONS**

1. A copy of the Health and Safety Notification (F10) will be provided.

2. The Principal Contractor shall provide the Client with all information which is required to update the Health and Safety File.

### **1.34 ENVIRONMENTAL BEST PRACTICE**

1. Ayrshire Rivers Trust is committed to safeguarding the environment and achieving sustainable development. The *Contractor* shall plan and order all his activities to assist Ayrshire Rivers Trust in achieving these goals.

2. The *Contractor* shall take due account of the constraints described elsewhere in the Specification and Site Information in his programme, management plan and construction methods.

3. The *Contractor* shall ensure that sound environmental practices are adopted and followed including PPG2, PPG5, PPG7 and PPG21 as well as CIRIA documents C532, C650, C503, C648 and C502.

4. The *Contractor* shall put in place a protocol to prevent and manage accidental spills and leakages prior to commencement of construction activities. A spill kit (including booms for potential leaks directly into the surface water bodies) should be kept on site at all times during operation and any major spills or leakages reported to SEPA.

5. The storage of oils and fuels shall be in a designated area, stored in bunds with 110% capacity, which will effectively capture any spills or leaks.

6. The *Contractor* shall put in place a protocol to control and manage runoff during the construction phase. Details and a plan on how groundwater, collected during any dewatering undertaken at the site, should be treated and disposed of should be included in the method statement for the construction phase.

7. The *Contractor* shall implement measures to prevent runoff of water from soil stockpiles on site, including covering stockpiles with impermeable material and bunding to prevent migration of any sediment entrained runoff into adjacent watercourses.

### 1.35 AS CONSTRUCTED DRAWINGS

1. As the work proceeds, the *Contractor* shall amend one copy of the drawings in red ink to show the details of the works which are actually constructed. These drawings shall be passed to the *Contract Administrator* for checking and approval as soon as the section of works shown on the drawings is completed.
2. The 'As - Constructed' records shall be kept by the *Contractor* on site and shall be available at all reasonable times for inspection and use by the *Contract Administrator* and by any person authorised in writing by the *Contract Administrator*.
3. The *Contractor* shall arrange for a full set of paper and electronic As-Constructed drawings to be supplied to the *Contract Administrator* within 28 days of Completion of the Works being granted.

### 1.36 LICENSES AND CONSENTS

1. The Employer is responsible for obtaining the following licenses / consents;
  - Planning Consent (North Ayrshire Council) – Granted June 2018.
  - CAR License (SEPA) – Obtained June 2018.
2. The *Contractor* shall comply with any conditions attaching to all licenses, consents and authorisations, once they are known (refer to **Appendix K**).
3. The schedule for the engineering activity undertaken under this contract will be transferred to the *Contractor* in advance of commencing works and will be surrendered at the end of the works period. There are no application fees associated with either the transfer or the surrender application process.
4. All other licences, consents and authorisations required to undertake the Works are the responsibility of the *Contractor* to acquire and pay for. The *Contractor* shall comply with any conditions attaching to these additional licences, consents and authorisations.

### 1.37 REDUCTION OF NOISE

1. The best practical means, as described in Section 72 of the Control of Pollution Act 1974, to reduce noise to a minimum shall be employed at all times.
2. The *Contractor* shall at all times have regard to the recommendations given in BS 5228 Noise Control on Construction and Open Sites and shall ensure that these are brought to the attention of sub-contractors/operatives. In particular the *Contractor* shall comply with the following requirements.
  - a) All vehicles and mechanical plant/ equipment used for the purpose of the Works shall be fitted with effective exhaust silencers;
  - b) All compressors shall be "sound reduced" models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all ancillary pneumatic percussion tools shall be fitted with mufflers or silencers of a type recommended by the manufacturers;
  - c) Machines in intermittent use shall be shut down in the intervening periods and where this is impractical, shall be throttled to a minimum;
  - d) All plant/ equipment and machinery shall be maintained in good efficient working order;

- e) Stationary plant/ equipment is to be sited away from any noise-sensitive areas where practicable and any plant/ equipment known to emit noise strongly in one direction shall be orientated so that the noise is directed away from such areas; and
  - f) No plant/ equipment shall be left running outside the normal working hours specified in the Works Information, without the prior consent of the *Contract Administrator*.
3. The terms and conditions of this guidance shall be without prejudice to any duty imposed on the *Contractor* by law and in particular by the Health and Safety at Work Act.

### 1.38 REDUCTION OF DUST

1. The *Contractor* shall monitor the amount of dust and follow best practice guidelines in order to minimise any impacts. E.g. dampen down roads and control and dust where necessary.

### 1.39 CONTROLLED WASTE – DUTY OF CARE

1. Where materials arising from, or required for, the Works constitute Controlled Waste under the Environmental Protection Act 1990 (Sections 33 and 34), the *Contractor* shall provide the *Contract Administrator* with a copy of the Carrier's Licence to transport the materials and copies of **all** waste transfer notes such that the source, carrier and disposal site are identified, along with the date, material and quantity.

### 1.40 SITE SECURITY

1. The *Contractor* shall be responsible for the safe storage and insurance against damage and theft of all materials and equipment.

### 1.41 LIASON WITH THE PUBLIC

1. The *Employer* may hold informal meetings with land owners and other interested parties from time to time. The *Contractor* shall be available to attend and participate in such meetings, which will generally be held on site or locally.

### 1.42 REPORTING

1. The *Contractor* shall at fortnightly intervals or as may otherwise be directed by the *Contract Administrator*, submit two copies of a progress report giving the progress of the work in relation to the accepted programme and covering the proposed activities for the next two weeks. The report should highlight any delays or interruptions to the Works. It should also review the proposed work for the following 2 weeks and highlight any potential delays/critical approvals required.

2. The *Contractor* shall submit to the *Contract Administrator* weekly, a detailed statement of all plant/ equipment and personnel employed on the Works, together with details of breakdowns and periods of stoppages.

3. The *Contractor* is to record all complaints received relating to the works or in connection with them, e.g. material delivery, off-site parking. Complaints are to be communicated to the *Contract Administrator* at the earliest opportunity.

4. The *Contractor* is to record all Agreements made with local third parties, e.g. for access, storage, parking etc. Agreements are to be communicated to the *Contract Administrator* at the earliest opportunity and to avoid any subsequent issues should be prior discussed.

5. The records (in sub clauses 3 and 4 above) shall include the details of the parties involved, date, time and nature of the complaint/agreement along with any time factors related to it.

### 1.43 CONTAMINATION

1. No contamination has been identified. However, if significant unsuspected contamination is found then:

- The *Contract Administrator* shall be informed at the earliest opportunity;
- All work shall cease unless otherwise agreed with the *Contract Administrator*;
- An appropriate investigation to determine the nature, extent and potential impacts of the contamination shall be undertaken unless already available; and
- A remediation Method Statement shall be agreed with the *Contract Administrator*.

2. Material forming the channel bar was sampled and a suite of chemical testing undertaken in April 2018. The results of the chemical analysis are included in **Appendix J**.

3. A suite of chemical testing was undertaken on 16No. soil samples and 1No. water sample collected during the intrusive ground investigation in June 2017. The results of these tests are included in **Appendix G**.

### 1.44 LIGHTING OF FIRES

1. Fires shall not be lit on the Site for any purpose.

### 1.45 EXPLOSIVES

1. The use of explosives shall not be permitted.

### 1.46 SCHEME SIGNBOARD

1. The *Contractor* shall supply, erect and maintain, for the duration of the contract, a signboard to be erected at an agreed location. This will give title to the works, the main parties involved and contact details. Size, content and contact details to be agreed with the *Contract Administrator*. Signboard to be erected prior to the start date, or as soon as practical thereafter should the lead time prohibit advanced placement.

### 1.47 VIBRATION

1. The *Contractor* shall give consideration to the extent of vibration on nearby structures when selecting the type of plant and method of working to be used.

#### 1.48 TREE PRUNING AND FELLING

1. Tree stumps (previously trees cut to 1m above ground level) identified for removal in order to accommodate the Works are shown on drawing **PB6282/1010**.

2. All works including pruning and felling (with the exception of barriers and ground protection within the working area) shall be in accordance with BS 3998 'Recommendations for Tree Work 1989'. BS 5837 and National Joint Utilities Group Volume 4. The *Contractor shall* submit details of the extent of pruning needed and to which trees to the *Contract Administrator* for approval.

#### 1.49 SETTING OUT

1. The baseline setting out information is generally provided on the general arrangement and cross section drawings.

2. The *Contractor* will establish these lines on site and confirm the position with the *Contract Administrator* before commencement of any construction works.

3. The *Contractor* shall check the provision of any level reference points shown on the drawings and confirm the position and level with the *Contract Administrator* before use for setting out the works.

4. The *Contractor* shall inform the *Contract Administrator* when all setting out reference points have been agreed, checked and confirmed.

## SECTION 2 - MATERIALS SPECIFICATION

### 2.4 AGGREGATES FOR CONCRETE

5. Aggregates for concrete shall comply with Clause 4.3 of BS 8500-2:2006.

### 2.20 CONCRETE– GENERAL

Delete **sub-clause 2** and replace with the following:

**S2.** Designed Concrete for the Works shall comply with the following:

	<b>Mix 1 Walls and Base of Fish Pass (Reinforced Structural Concrete)</b>
Mix	Designed
Exposure class	XC3 & XC4, XF3
DC - Class	DC-2
Intended working life - years	50
Minimum Compressive strength class	C32/40
Slump class	S3
Max. <sup>m</sup> w/c ratio	0.60
Min. <sup>m</sup> cement kg/m <sup>3</sup>	280
Cement combination type	IIA-V, IIB-V, IIB-S, IIIA, IIIB
Max. <sup>m</sup> aggregate size mm	20
Coarse Aggregate	10/20 to BS EN 12620
Fine Aggregate	0/2(MP) or 0/4(MP) to BS EN 12620
Chloride Content Class	Cl 0,40 (0,40)
Air Content	4.5
Fibers	-
Other aggregate requirements	MS25
Required admixture	Admixtures complying with BS EN 932-2 permitted, subject to written approval
<b>Other requirements</b>	
Cover to reinforcement - mm (Cover to BS8500)-	minimum = 40 deviation factor = 10 nominal = 50

**Add the following sub-clauses:**

6. Blinding Concrete shall be Designated Concrete GEN1 or Standardized Prescribed Concrete ST2.

7. Unreinforced channel infill and access steps shall be Designated Concrete PAV2.

8. For unreinforced concrete, Class II Polymer fibres conforming to BS EN 14889-2 to be added to the concrete to the manufacturer's recommended dosage and in accordance with the method stated in the manufacturer's instructions. They shall be evenly dispersed through the concrete.

**2.22 CONCRETE– READY MIXED**

Delete **sub-clause 2** and replace with:

**S2.** The delivery ticket required for each load of ready-mixed concrete shall, in addition to the information listed under BS EN 206-1 Clause 7.3, detail:

- a) the type of aggregate;
- b) the actual cementitious content and the percentage of any pfa or ggbs included;
- c) the position of the concrete in the Works. (details to be inserted at the point of discharge);
- d) the proportion of any admixture; and
- e) the time of arrival on Site.

**2.50 GENERAL FILLING MATERIALS**

This clause is deleted. Refer to Clause 3.6

**2.56 GRASS SEED**

Delete **sub-clause 1** and replace with:

**1.** Grass seed shall be a tested blend of named varieties, and certificates of purity and germination shall be provided.

The blend for use on the river banks shall consist of seeds of Scottish provenance and contain the species listed below:

- Strong creeping red fescue – 60%
- Chewings fescue – 25%
- Flattened meadow grass – 10%
- Browntop bent – 5%

**2.60 HANDRAILING AND BALUSTERS**

6. The design loading for handrails shall be in accordance with BS6399: Part 1:1996: Table4, case 3(ix) and part 3 of BS 5395 heavy duty loading of 0.74kN/m.

7. The height of the handrail shall be 1.1m unless otherwise noted.

8. The access gate shall open “inwards” i.e. towards the bank. The gate shall be lockable with a padlock to prevent unauthorised access.

9. Handrail fabrication, layout and fixing drawings shall be submitted to *Contract Administrator* for approval before installation may commence.

10. Handrails must achieve the required dimensions contained in the Work at Height Regulations 2005 for construction of work barriers; having a maximum vertical gap of 470mm. Where this is not achieved with an intermediate rail or use of mesh, infill panels or a toe board may be required in agreement with the Client.

### **2.62 IMPORTED TOPSOIL**

3. *Contractor* shall provide details of proposed source of topsoil for approval of *Contract Administrator* prior to placement.

### **2.86 NUTS, SCREWS, WASHERS AND BOLTS**

7. All bolts, nuts and washers to be hot dip galvanised in accordance with BS EN ISO 1460.

### **2.89 PERMANENT FENCING**

1. Permanent fencing shall comprise timber post and 3 rail fencing complying with BS1722 Pt.7 (e.g. Highways Construction Detail Drawing H15 of the Manual of Contract Documents for Highway Works). Details to be submitted to the *Contract Administrator* to seek agreement with the landowner.

2. A timber wicket gate shall be provided for pedestrian access (e.g. Highways Construction Detail Drawing H23 of the Manual of Contract Documents for Highway Works). Details to be submitted to the *Contract Administrator* to seek agreement with the landowner.

### **2.120 STEEL REINFORCEMENT**

4. High yield steel reinforcement for concrete shall be ribbed bars Grade B500B or B500C to BS4449:2005.

5. No welding of reinforcement shall be carried out without the approval of the *Contract Administrator*.

### **2.143 GEOTEXTILE**

1. Geotextile filter/separator to be placed beneath the bed and bank protection shall be nonwoven material manufactured from UV stabilised, high tenacity, virgin polypropylene fibres that have been mechanically entangled to provide high strength, high extensibility, high loft and excellent abrasion characteristics such as Geofabrics HPS4 or similar approved by the *Contract Administrator*.

2. Geotextile shall be placed in accordance with manufacturer’s instructions.



3. The main functions of a geotextile used beneath rock armour or rip-rap for erosion control are filtration and separation. The geotextile shall be manufactured under factory production control guidelines set out within EN 13253; Geotextiles and geotextile related products – characteristics required for use in erosion control works (coastal protection, bank revetments). The manufacturer must be able to supply accompanying CE documentation upon request.

4. Geotextiles shall be delivered to site in packaging, which will protect the product from damage during handling, storage. Packaging must be suitable to protect the product from UV degradation. Product must be kept in appropriate packaging until such time that it is required for installation. The geotextile shall be clearly and indelibly marked with the product name along the edge of the roll at regular intervals no greater than 5m. The labelling shall clearly identify the product supplied in accordance with EN ISO 10320: Geotextile and Geotextile related products – Identification on site.

5. The rolls of geotextile shall be stored on level ground and stacked not more than five rolls high and no other materials shall be stacked on top.

6. The geotextile shall be laid and installed in the positions and to the line and levels described on the drawings. Construction plant must not operate directly on the geotextile.

7. Joints shall be formed by overlapping by a minimum of 1m. A reduction in overlap to 0.3m may be considered by the *Contract Administrator* where the sub-layer is firm and above water level.

#### **2.144 ANCHORS / DOWELS TO ROCK BED**

1. Rock anchors / dowels to provide resistance to horizontal shear equivalent to 15kN per metre run of fish pass channel. Dowels to comprise ribbed steel bars in accordance with BS4449.

2. Minimum embedment into rock 400mm. Minimum embedment into concrete base 250mm.

3. Holes to be cored into bedrock for anchors to be 42mm diameter. Loose material to be cleared from holes using high pressure water jet or similar approved.

4. Drawings and associated details to be provided to the *Contract Administrator* and approval granted before construction commences.

#### **2.145 ADHESIVES**

1. Rock anchors / dowels are to be fixed using HILTI HIT-RE 500 Adhesive or similar approved by the *Contract Administrator*.

2. Adhesives shall be placed in accordance with the manufacturer's instructions.

#### **2.146 ROCK ARMOUR**

1. Armour stone shall comply with BS EN 13383.

2. The *Contractor* shall provide full details of rock proposals and these shall be approved by the *Contract Administrator* before any rock is delivered to site. The details shall include source (name and location of quarry), properties and gradings and any documentary evidence of recent test results.

3. Only rock from a source and of a type approved by the *Contract Administrator* shall be used in the works.
4. The *Contract Administrator* shall have the right at any reasonable time to make inspections of any proposed source nominated by the *Contractor* at the start of the contract or any new source proposed by the *Contractor* during the period of the contract. The *Contractor* shall provide transport and access to each site for the *Contract Administrator* and a representative of the Employer.
5. Approval of a source and type of rock shall not be construed as relieving the *Contractor* of his obligations to supply material in the finished Works in conformity with the requirements of this Specification. The *Contractor* shall carry out, at his own expense, all such testing, etc. as is necessary to ensure compliance therewith. The source of the rock shall be such as to ensure the provision of a uniform structure both in colour and appearance.
6. Rock armour shall be standard grade LMA 40/200 in accordance with BS EN 13383.
7. Each consignment of rock armour shall have a System 4 CE conformity marking to BS EN 13383. Each consignment shall also have a written statement of the quantities delivered of each rock grading.
8. The *Contractor* shall take all necessary precautions to avoid unplaced rock, including rock fragments, from becoming accidentally buried. This particularly applies to rock stockpiles. The *Contractor* shall be responsible for undertaking a survey of stockpile sites before they are handed over, and shall identify and retrieve all such surplus rock both during the course of the Works and at a later date if it becomes buried. Any damage caused by such rock shall be made good.
19. Any surplus imported rock shall be removed from the site unless specific provision has been made within the Contract for the disposal of such material on site.

## **2.147 STEEL LARINIER FISH PASS BAFFLES**

1. Larinier fish pass baffles fabricated to dimensions shown on drawing **PB6282-1015** by Fishtek or similar approved.
2. Units to be fabricated from 100x10 stainless steel to BS EN 10088:1995 1.4307 (304L) unless otherwise approved.
3. Top edges of baffles to be fully rounded.
4. Baffles welded to baseplate with 6mm fillet weld (all fillet welds to be ground flush).
5. Top two baffles of upper flight to be 10mm thick and fixed with 8mm fillet fully welded all around. Vertical tolerance for installation for top 2 baffles is  $\pm 1$  mm.
6. Units to be sized to allow safe handling to facilitate safe installation.
7. Drawings and associated details to be provided to the *Contract Administrator* and approval granted before fabrication commences.

## **2.149 SECURITY SCREENS**

1. Steel for security screens to be galvanised to hot dip galvanised in accordance with BS EN ISO 1460.

2. Security screens to have 12 x 75mm galvanised bars with rounded edges.
3. Drawings and associated details to be provided to the *Contract Administrator* and approval granted before fabrication commences.

### 2.150 STOP LOGS

1. Proprietary stop log system to be incorporated at upstream extent of fish pass to allow occasional maintenance. Stop logs and manual lifting poles of suitable length shall be provided by the *Contractor* upon completion of the works.
2. Stop logs to be Aquatic Control Heavy Duty Stop Logs (ksl) or similar approved, 90mm by 150mm, spanning 1000mm. Stop logs required to create a 1500mm high barrier. The maximum height of any single stop log shall be 300mm.
3. Drawings and associated details to be provided to the *Contract Administrator* and approval granted before fabrication commences.
4. Manufacturer's installation operation and maintenance recommendations to be provided for inclusion in the Health and Safety File.

### 2.151 OPEN MESH FLOORING

1. Fish pass to be covered with proprietary GRP open mesh walkway with anti-slip surface and secured with clamping system to prevent unauthorised removal or flotation when water levels rise above level of GRP.
2. Prior to fabrication detailed drawings including fixing and anchorage details of the flooring to the supporting elements and to the structure to be provided to the *Contract Administrator* for review. Drawings to include weight of individual elements to inform manual handling / lifting requirements. Calculations including assumptions and evidence of verification and approval also to be provided.
3. Details of anti-slip surface of open mesh flooring be provided to the *Contract Administrator* for approval.
4. Sizing of elements to take into account ease of handling on site for first installation and future maintenance.
5. The open mesh flooring shall be capable of supporting all loads transferred from flood water, debris impact, debris storage, personnel access and provision of light equipment. Reference should be made to Eurocode 1 – Actions on Structures (BS EN 1991). There is one load case to be considered in the design and the open mesh flooring:  
Load case 1
  - Weight of structural elements associated with the open mesh flooring and the flooring itself
  - Weight of all ancillary fixtures / fittings
  - 5kN/m<sup>2</sup> Uniformly distributed load on open mesh flooring representing pedestrian access and light equipment loads during normal operating conditions
  - 2.5kN/m<sup>2</sup> Uniformly distributed load on open mesh flooring representing trash storage during normal operating conditions
 In the load case described above a Factor of Safety (FOS) shall be required:

- FOS for permanent actions shall not be less than 1.35,
- FOS for variable actions shall not be less than 1.5.

6. All dimensions for the purpose of the design calculations are to be taken from construction issue drawings. Dimensions for fabrication are to be taken from an 'as built' survey of the Works by the *Contractor* and checked against the values used for design calculations.

### **2.152 CONCRETE ACCESS STEPS**

1. The access steps to the fish pass shall be cast in situ with brushed finish to goings and landing.
2. The steps shall have step nosing clearly distinguishable from steps by colour or brightness. Nosing shall be integral with the step and measure 55mm wide on both treads and riser.

### **2.153 ACCESS LADDER**

1. Access ladder to be permanently fixed ladder in accordance with BS 4211.
2. Steel for security screens to be galvanised to hot dip galvanised in accordance with BS EN ISO 1460.
3. Drawings and associated details to be provided to the Contract Administrator and approval granted before fabrication commences.

## SECTION 3 – EXCAVATION, BACKFILLING AND RESTORATION

### 3.1 EXCAVATION

9. Silt is to be removed from areas shown on the construction drawings.

10. Immediately after initial excavation, silt shall be re-positioned on the top of the channel embankment so any wildlife can filter out of the silt.

11. The *Contractor* shall undertake a before and after survey to determine volumes of material removed.

12. Silt shall be moved to the onsite stockpile area for drying and reuse as agreed with the *Contract Administrator*.

13. Care shall be taken when creating spoil heaps to avoid damage to the adjacent river banks. Loading of embankments must be considered along with any potential restriction the placement would place on the works. Care shall also be taken whilst clearing spoil heaps to avoid damage to the surrounding area.

### 3.6 BACKFILLING

#### Delete the clause and insert:-

1. All earthworks shall be undertaken in accordance with the Clauses specified below from Series 600 of “The Manual of Contract Documents for Highway Works Volume 1 – Specification for Highway Works, November 2009” and subsequent amendments.

- Clauses, 601 (sub clauses 2.ii, 3. and 4. of Clause 601 do not apply), 602, 603, 604, 608, 609, 610, 611 and 612.

2. The fill material will be Class 6P in accordance with “The Manual of Contract Documents for Highway Works Volume 1 – Specification for Highway Works, November 2009” Table 6/1. Suitable excavated material from site to be used where possible.

3. The effective angle of internal friction of fill material is to be at least 32°.

4. The *Contract Administrator* accompanied by the *Contractor’s* representative shall be given the opportunity to visit proposed sources of fill in advance of any materials being taken to site, in order to comment on the likely suitability of the material.

5. Backfill material placed behind the walls shall be a combination of locally won excavated material (where meeting the requirements of the specification) and imported fill.

6. Locally won excavated material shall be inspected and degradable/putrescible material such as wood and plastic and particles greater in size than 100mm shall be removed prior to re-use. Locally won excavated material which contains sufficient fine grained particles such that it resembles a sludge shall also be removed.

7. Locally won excavated material shall be laid and lightly compacted in 300mm layers. The differences in level of the back fill shall not exceed 200mm across any one section.

8. Imported fill shall be compacted to 90% of its maximum dry density (BS1377:4 4.5kg rammer).
9. Wherever possible, material excavated and screened for any present contaminants will be re-used on site for backfilling.

### 3.9 REINSTATEMENT OF UNPAVED LAND

6. On completion of work in unpaved land the *Contractor* shall break up the structure of all land affected to a depth of at least 300mm and clear stones and extraneous material greater than 50mm in size before replacing topsoil and shall cultivate and restore the land as closely as possible to its original condition.
7. The full extent of all working areas whether affected by the permanent works or by temporary works and accesses shall be reinstated as soon as possible after completion of earthworks.
8. Reinstatement operations shall generally comply with the requirements of BS4428.

### 3.16 DEMOLITION

2. The *Contractor* shall minimise the extent of the local demolition of the existing weir as far as practicable and adopt a suitable working methodology to minimise risk to the structural integrity of the remaining weir structure (in both temporary and permanent cases).
3. The new works shall be structurally tied (e.g. through drilling and fixing of dowels) into the remaining section of the existing weir to provide stability to the existing structure. The joint/interface between the new and existing structure is to be watertight to the crest height of the existing weir.
4. The *Contractor* shall provide a detailed method statement on the proposed demolition methodology and tie-in/reinstatement detail for approval by the *Contract Administrator* prior to work commencing.

### 3.17 TEMPORARY WORKS

1. The design of Temporary Works associated with earthworks, including temporary slopes, stockpiles and drainage shall be such that the risk of failure is not more than that which would be adopted if the Temporary Works were to be permanent. Allowance shall also be made for the surface water and groundwater conditions which are likely to occur during construction.

### 3.18 DISPOSAL OF EXCAVATED/SURPLUS MATERIAL

1. A suite of chemical testing was undertaken on 16No. soil samples and 1No. water sample collected during the intrusive ground investigation in June 2017. The results of these tests are included in **Appendix G**. Excavated / surplus material shall be tested and categorised before being disposed of off-site. Depending upon the categorisation, the material shall then be sent to a suitably licensed disposal site. The *Contract Administrator's* approval shall be required before any material is disposed of and that approval will only be given on receipt of suitable testing and reporting.
2. Prior to disposal, material shall be stored in appropriate bunded areas such that separate categories of material are stored separately and any contaminants are contained.

### 3.19 CONTAMINATED LAND

1. If contaminated material is encountered during the works, the Designer should be informed immediately.
2. If the seepage of contaminated ground water is detected within the excavation, then the contaminated water shall be isolated and removed from site for disposal at a location agreed by the *Contract Administrator* and Local Authority.

### 3.20 LANDSCAPING

1. Landscaping details beyond what is included in this specification are to be agreed with the *Contract Administrator* following consultation with the landowners.

## SECTION 4 – CONCRETING AND FORMWORK

### 4.1 SUPPLY OF INFORMATION

2. All references to BS 8500-1 and BS 8500-2 in CESWI 7 shall be read as BS 8500-1:2015+A1:2016 and BS 8500-2:2015+A1:2016 respectively.

3. At least seven days before commencement of concreting operations the *Contractor* shall submit to the *Contract Administrator* for acceptance a Method Statement covering all aspects of concrete work including:

- a) Sources of supply of materials
- b) Details of concrete mixes
- c) Batching, delivery and placing arrangements
- d) Formwork, finishing, protection and curing
- e) Quality control, frequency of sampling and testing details
- f) Supervision and labour

3. The proposals contained in the Method Statement must cover concreting during the whole of the construction period and have regard to the likely prevailing weather conditions at the time of casting.

### 4.3 IDENTITY TESTING

3. Routine identity testing of concrete shall be carried out for slump at the point of discharge with one test from each batch.

4. In the case of a nonconformity, the *Contractor* shall obtain instructions from the *Contract Administrator* immediately.

5. Maintain complete correlated records including:

Sampling, site tests, and identification numbers of specimens tested in the laboratory.

Location of the parts of the structure represented by each sample.

Location in the structure of the batch from which each sample is taken.

6. Routine identity testing for strength shall be based on one sample per 20 cu.m of concrete or part thereof.

7. The identity testing laboratory shall be accredited by UKAS or other national equivalent. The name and UKAS reference number of the laboratory shall be submitted well in advance of making trial mixes or concrete for use in the Works.

8. Three copies of test reports shall be submitted within one day of the completion of each test and a complete set of reports shall be maintained on Site for inspection.

9. Concrete which does not comply with the Specification shall be rejected and shall be broken out and replaced or otherwise dealt with as instructed by the *Contract Administrator*.

10. The *Contractor* shall bear the cost of all-cutting, testing, remedial work, etc., resulting from the failure of one or more cubes or cores, or any other aspect of the concrete to meet the specified requirements.



#### 4.5 TRANSPORTING, PLACING AND COMPACTING

6. Except where otherwise directed, concrete shall not be placed unless the *Contract Administrator* or their Representative is present and has previously examined and approved the positioning, fixing and condition of the reinforcement and of any other items to be embedded, the cleanliness, alignment and suitability of the containing surfaces and the cleanliness/condition of any substrate/concrete surface.

7. The *Contractor's* attention is drawn to the importance of achieving a high degree of compaction in order to produce as dense a concrete as possible, without causing segregation, and a fair worked surface finish conforming to the requirements of **Clauses 4.21** and **4.22**.

#### 4.8 CURING

Replace *Curing Class 2* with *Curing Class 3* in **sub-Clause 1**

4. The method of curing must minimise the effects of drying, shrinkage and thermal movements due to rapid temperature change in the concrete until it has achieved sufficient strength to be able to resist such effects.

5. The *Contractor* shall prevent the formation of excessive temperature gradients through the mass of the concrete, which could in turn lead to early thermal cracking e.g. providing thermal blankets during cold weather.

6. The *Contractor* shall submit his detailed proposals for concrete curing for approval. The proposal must include details of concreting in cold weather and must comply with the good working practice in the advice given in Concrete on Site No. 11 - Winter Working published by the British Cement Association, and must permit work to continue through all but exceptionally cold spells of weather.

7. A maximum/minimum thermometer shall be kept on site at all times and located in a position to register the ambient atmospheric air temperature.

#### 4.9 RECORDS OF CONCRETING

Delete **sub-clause 1** and replace with:

1. Records shall be kept by the *Contractor* of the positions in the Works of all batches of concrete together with the dates and times when the works were carried out and the weather and temperature conditions pertaining at those times. The records shall include the strength class, designation or reference of the concrete, its slump (where measured) and details of all test cubes, cores or other specimens taken from them. Copies of these records shall be supplied to the *Contract Administrator*.

#### 4.10 CONSTRUCTION OF FORMWORK

7. The *Contractor* shall take every precaution in the selection and use of forms, removing the forms and curing the concrete to prevent rapid temperature variations in the concrete.

8. Shuttering materials shall be selected with due consideration to the nature of the structure under construction, with particular regard to the size of individual shuttering panels. Excessive numbers of small panels will not be accepted by the *Contract Administrator*.

9. Shutters shall be recycled / re-used so long as the condition of which will not have an adverse effect on the finishing.

#### 4.12 STRIKING OF FORMWORK

In **sub-clause 2(a)** replace 5N/mm<sup>2</sup> with 10N/mm<sup>2</sup>.

4. Striking times for formwork shall be agreed in accordance with the recommendations of CIRIA Report 136.

#### 4.16 SURFACE CONDITION OF REINFORCEMENT

2. Reinforcement which shows excessive signs of surface corrosion shall not be incorporated in the works until it has been thoroughly washed with clean/ potable water and, if appropriate, cleaned with a wire brush or equivalent to the satisfaction of the *Contract Administrator*.

#### 4.22 SURFACE FINISHES PRODUCED WITH FORMWORK

7. Where indicated on construction drawings, a formliner system such as Insitex or similar approved system is to be used to create a masonry blockwork appearance to the concrete surface. The *Contractor* shall submit his proposed product to the *Contract Administrator* for approval prior to commencement of the works.

8. The maximum depth of the relief pattern is to be selected to ensure that the minimum cover to the reinforcement is maintained.

#### 4.25 TOLERANCES FOR CONCRETE SURFACES

S1. In-situ cast concrete surfaces in the final work shall not vary by more than the permissible amounts shown in the table below:

Dimension Measures	Tolerance (mm)			
	Finish Produced with Formwork		Finish Produced without Formwork	
	Rough	Fair/Fair Worked	Screeded	Wood/Steel Float/ Brushed
Position	±20	±20	±10	±10
Alignment	±10	±10	±10	±3
Height up to 5m	±10	±10	-	-
Level	±5	±5	±5	±5
Thickness	±10	±5	±5	±5
Straightness in 5m	±5	±10	±10	±10
Plumb per m: limit (mm)	5:15	3:15	-	-

Step displacement between adjacent pours	5	3	5	0
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**Insert the following clauses:**

#### **4.29 REMEDIAL TREATMENT**

1. Any remedial treatment necessary shall be agreed with the *Contract Administrator* following inspection after removal of formwork. The *Contractor* shall carry out no remedial work before the *Contract Administrator* has undertaken an initial inspection of the concrete. Any “bagging up” done without the prior approval of the *Contract Administrator* will be sufficient for that complete section of concrete to be condemned by the *Contract Administrator* and broken out by the *Contractor*.
2. All remedial treatment will be undertaken within 48 hours of the formwork being removed. Failure to undertake remedial works as agreed with the *Contract Administrator* will be sufficient for that complete section of concrete to be condemned by the *Contract Administrator* and broken out by the *Contractor*.
3. All concrete work shall be signed off as acceptable within 48 hours of the formwork being removed. Failure to gain approval for the works will be sufficient for that complete section of concrete to be condemned by the *Contract Administrator* and broken out by the *Contractor*.
4. Any concrete which exhibits significant defect over 20% of any surface shall be automatically condemned by the *Contract Administrator* and broken out by the *Contractor*.

**Appendix A - Drawings**

**Appendix B – CDM Hazard Log**

**Appendix C – Topographic Survey (March 2016)**

**Appendix D – Utilities Search (February 2016, December 2017)**

**Appendix E – Ecological Survey Reports (March 2016 & April 2018)**

**Appendix F – Geotechnical Desk Study (March 2016)**

**Appendix G – Ground Investigation Report (June 2017)**

**Appendix H – Pre-Construction Information (PCI)**

**Appendix I – Buildability Report**

**Appendix J – Soil Analysis (April 2018)**

**Appendix K - Licenses**





With its headquarters in Amersfoort, The Netherlands, Royal HaskoningDHV is an independent, international project management, engineering and consultancy service provider. Ranking globally in the top 10 of independently owned, nonlisted companies and top 40 overall, the Company's 6,500 staff provide services across the world from more than 100 offices in over 35 countries.

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