TECHNICAL NOTE

Client	Wrexham Association Football Club
Project	Fanzone & Temporary Stand Extension
Report Date	30/08/24
Title	Surface Water & Foul Water Strategy

Overview

This technical note sets out the strategy for managing the foul water and surface water for both the temporary stand extension and new fanzone at the STōK Cae Ras Stadium in Wrexham.

The strategy for both the foul water and surface water follows the same principles that were set out in the original application for the temporary stand making assessments against the consented Kop Stand design where relevant.

Overall, the foul water flow rates remain below the consented Kop Stand design and the surface water maintains an infiltration-based approach using permeable surfaces in the new fanzone.

Reference should be made to the Ramboll Technical Note – WAFC Temporary Spectator Stand – Drainage Statement which is contained within Appendix B of this note.

Drawings for both the temporary stand and fanzone are included within Appendix A of this note.

Foul Drainage

The strategy follows the same approach to that submitted for the original temporary stand application where the spectator capacity of the temporary stand is lower than that of the consented scheme.

The capacity of the consented Kop stand is 5,500 and the capacity of the temporary stand has been increased to 2,964. In addition, the fanzone has been added to the rear of the temporary stand which has a capacity of 1,500. However, the 1,500 capacity for the fanzone forms part of the 2,964 temporary stand capacity. This figure remains below the capacity of the consented Kop Stand

Using a pro-rata method to establish the increased foul flows on the figures calculated by Ramboll in the original temporary stand application the revised foul flow rate is 8.23l/s. This remains below the consented peak of 16l/s.

Surface Water

The extension to the temporary stand is a cantilever at high level and hence doesn't increase the footprint of the stand or the consented temporary stand surface water strategy.

The addition of the fanzone creates an additional area of hard standing on the site. The surface water strategy adopted here is to follow the same principles as the original temporary stand

application and maintain the original site characteristics. There were no positive surface water connections on the site previously and the surface water infiltrated to ground. Infiltration tests were undertaken as part of the Kop Stand design which confirmed infiltration is viable. Reference should be made to the Ramboll report attached for infiltration test results.

Consequently, the new area of hardstanding has been specified as being fully permeable, with open graded permeable asphalt on a Type 3 sub-base with 30% voids to allow the water to infiltrate to ground.

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Appendix A – Relevant Drawings

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EXISTING PITCH

Turf Hotel

Macron stand

Wrexham Lager Stand

VOMITORY 5
525 SEATS
Egress Time :
1.30m exit width x 66 persons per min. = 85.80
525 / 85.80 = 6.11 mins.

VOMITORY 4
622 SEATS
Egress Time :
1.30m exit width x 66 persons per min. = 85.80
622 / 85.80 = 7.25 mins.

VOMITORY 3
670 SEATS
Proposed Egress Time :
1.30m exit width x 66 persons per min. = 85.80
670 (Max) / 85.80 = 7.81 mins.

VOMITORY 2
622 SEATS
Egress Time :
1.30m exit width x 66 persons per min. = 85.80
622 / 85.80 = 7.25 mins.

VOMITORY 1
525 SEATS
Egress Time :
1.30m exit width x 66 persons per min. = 85.80
525 / 85.80 = 6.11 mins.

Derogation for 1 no less accessible and helper position at each side

Derogation for 1 no less accessible and helper position at each side

Secondary means of escape stair to remain as existing

Access gate to generator

SANITARY AND CONCESSION

3100 CAPACITY

SANITARY BS 6465-1:2006
Table 7

MALE @ 80% = 2480

36 x Urinal *(40 SHOWN)*
10 x WC *(20 SHOWN)*
17 X WHB *(15 SHOWN)*

FEMALE @ 30% = 1500

42 x WC *(42 SHOWN)*
28 X WHB *(24 SHOWN)*

CONCESSIONS

1 POSITION PER 200 PEOPLE = 16 (16 SHOWN)

FAN ZONE ADDITIONAL CONCESSION

14 Accessible + 14 Helper

14 Accessible + 14 Helper

EGA SEATS = 2,964

3m strip at back of stand is concourse under stand

N 350914366.61
E 332860082.20

Derogation for extended travel distance to Acc WC 42m / 2m over

Accessible WC

Female WC

ACCESS

CONCOURSE
1092 SQ.M
(MIN 758 SQ.M)

Male WC

Female WC

Existing Manhole

Lighting Post

Gates in fencing to allow concessions and toilet to be used from concourse or fan zone

Concessions

Additional Ticket check lanes added

Lighting Post

Lighting Post

New Gate in fencing

Lighting Post

+ Additional Tarmac area shown in red = 2201 sq.m

Lighting Post

FAN ZONE
1232 sq.m @ 0.5 sq.m/p = 2,464 occupancy

Lighting Post

Lighting Post

Double herrace fence line (width TBC)

Lighting Post

New gate onto Crispin Lane

Existing gate

Female WC

Male WC

Female WC

Derogation for extended travel distance to Acc WC = 48m / 8m over

ACCESS

N 350971832.20
E 332899848.47

Accessible WC

Male WC

Female WC

Female WC

Male WC

New gate

Lighting Post

HV Cable

Lighting Post

Double herrace fence line (width TBC)

Lighting Post

Existing gate 5m clear required check on site - widen if required

Lighting Post

Lighting Post

NORTH

0 5m 10m

Lighting Post

Lighting Post

Lighting Post

Double herrace fence line

Lighting Post

Lighting Post

Temporary Stand Planning Boundary

Other land in Wrexham AFC Ownership

EMERGENCY ACCESS AND EGRESS

MAIN GA ACCESS AND EGRESS

Crispin Lane

1 Temporary Stand Plan for SAG
1 : 200

NOTES
All dimensions and levels to be checked on site

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rev no.	rev date	rev by	description
P5	26.06.24	WR	Amendments to suit latest discussions
P4	24.06.11	WR	Concessions and toilts moved to avoid HV cable
P3	24.06.07	WR	Latest Amendments
P2	23.05.24	WR	Amended to suit latest discussions
P1	15.05.24	WR	FIRST ISSUE

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Kop Development

location
Racecourse Ground

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key plan

drawing title
Proposed Temporary Stand
3000 Seat Option Plan

AFL job number 231547 | scale @ A1 1 : 200 | drawn WR | checked JR | rev date 26.06.24

dwg purpose: Information | status: S2 | rev: P5

bim project origin zone level type role 5-digit no.
231547-AFL-Z4-ZZ-SK-A-20101

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Appendix B – Original Temporary Stand Drainage Technical Note

Technical Note – WAFC Temporary Spectator Stand – Drainage Statement

Project name	**Wrexham Association Football Kop Development**
Project no.	**1620012485**
Client	**Wrexham AFC**
Memo no.	**RAM-C-WAFC-TN01**
Prepared by	**James Wood**
Checked by	**Jonathan Wilkinson**
Approved by	**Daniel Scarfe**

1 Introduction

1.1 Consented Permanent Stand

Wrexham County Borough Council planning application P/2022/0725 was granted permission 04/08/2022. The development comprises Kop Development for 5,500 seats, inclusive of a 500 capacity hospitality area, with a 600 capacity non-match day exhibition space, new public realm and associated works.

1.2 Proposed Temporary Stand

Planning consent is now sought for the proposed construction of a temporary spectator stand, interim to full construction of the consented permanent development. The temporary stand will accommodate 2,289 seats plus space for 20 additional wheelchairs. No hospitality / exhibition space is proposed as part of the temporary construction.

Drawing 31547-AFL-Z4-ZZ-DR-A-20006 P1 illustrates the proposed temporary development and is attached as Appendix 1.

1.3 Structure of Technical Note

This Technical Note presents a review of the drainage reports submitted in support of the consented permanent stand.

The surface water and foul water features of the proposed temporary stand have been compared, with the conclusion that the proposed temporary stand falls 'within' the parameters of the consented scheme. Therefore, no additional drainage reports are required to support the temporary condition.

Whilst the consented permanent stand will be operational on non-match days (e.g. for exhibitions), this note considers only match-day impacts because the proposed temporary stand will be operational on match days only.

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2 Drainage summary for the temporary stand

The following Wrexham Association Football Club Kop Development drainage report was submitted in support of planning application P/2022/0725:

- WRX-RAM-XX-XX-RP-CD-00001;

2.1 Foul Water

2.1.1 Introduction

The existing stand is currently condemned and unused with a capacity of 5000, the proposed stand is to provide seating for up to 5500 fans and the temporary stand to provide capacity for 2309 fans. The consented development was for 5500 however this will be limited to 5000 (matching the existing Kop capacity) until additional phosphate mitigation can be confirmed and accepted by Welsh Water / Wrexham County Borough Council for the additional 500 fans. Given the temporary stand will provide capacity for a significantly lower number than both the consented and historic Kop with a capacity of 2309 it is assessed to be 'within' the parameters of the consented scheme. Therefore, no additional drainage reports are required to support the temporary condition.

2.1.2 Foul water loading

The expected population for the development will vary due to the nature of the development. However, for the purpose of these calculations the maximum capacity of the temporary stand will be utilised as this would generate the highest flow. The capacity of the temporary stand will be 2309, this does not include staff, so for the purpose of these calculations a value of 2350 will be used to provide an allowance for the total occupation during a match event.

To establish the expected flow per person 'Flows & Loads 4' will be utilised to determine the most suitable scenario. The most applicable activity would be 'Local community sports club, e.g. squash, rugby & football' which gives a base flow of 40 litres per person per day. Applying this value to the 2350 expected capacity of the temporary stand, a total foul flow volume can be calculated.

Therefore;

$$U = 2350\ x\ 40\ {}^{l}/_{p}/d = \mathbf{94{,}000\ \boldsymbol{litres\ per\ day}}$$

A four-hour duration for an event is being utilised for a peak value for the foul flows. The peak foul flow, Qpop can be calculated as follows:

$$Qpop = \frac{U\ (in\ litres)}{t\ (in\ seconds)}\ l/s$$

Therefore,

$$Qpop = \frac{94{,}000\ l}{4\ x\ 60\ x\ 60s} = \mathbf{6.53\ \boldsymbol{l/s}}$$

The foul water from the temporary stand will be discharged off site through the use of portable toilets with self-contained foul tank. and will not be positively connected into the Welsh Water below ground

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drainage infrastructure. The allowable discharge for the consented application was a peak of 16 l/s which is significantly more than the temporary stand.

2.2 Surface Water

2.2.1 Temporary Proposal Surface Water Strategy

The temporary stand will be constructed on the existing site and thus will mimic the existing site characteristics in terms of surface water discharge. From a review of survey information, it has been identified that there is no positive surface water drainage and that the surface water infiltrates directly to ground. Given that the strategy for the temporary stand mimics the current site strategy it is not deemed to have any effect on the current site situation, the consented design will then be implemented for the consented scheme. Therefore, no additional drainage reports are required to support the temporary condition. Section 2.2.2 below shows information relating to the infiltration testing carried out on the development used to support the consented development.

2.2.2 Infiltration testing

Infiltration testing has been undertaken in accordance with BRE digest 365, the test results have confirmed that the soil characteristics are suitable for managing the surface water via infiltration. Table 1 below details the soakaway test results which can be found in Appendix 2. This proves how the current undeveloped site which has no positive drainage manages surface water, which will be replicated in the temporary condition. The consented strategy manages surface water through the implementation of SuDS and a geocellular soakaway tank. The CIRIA SuDS Manual identifies the below values as having good infiltration media.

Table 1 - Soakaway test results

Reference	Infiltration rate (m/sec)
TP01 – Test 1	7.3×10^{-4}
TP01 – Test 2	4.7×10^{-4}
TP01 – Test 3	4.0×10^{-4}
TP02 – Test 1	1.4×10^{-3}
TP02 – Test 2	5.2×10^{-4}
TP03 – Test 3	4.2×10^{-4}

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3 Comparison of Temporary Proposals with Consented Development

Table 3-1 summarises a comparison of the drainage features of the proposed temporary spectator stand with the consented development.

Table 3-1 – Comparison of Temporary Proposals with Consented Development

Feature	Consented Development	Temporary Stand Proposals
Seats	5,500 seats.	2,289 seats plus space for 20 additional wheelchairs.
Hospitality / exhibition space	500 person hospitality area / 600 person non-match day exhibition space.	None.
External works	Proposed hard landscaping to the front of the development with porous surfacing pitchside of the proposed Kop.	No permanent change to the existing site surfacing.
Foul water drainage	Discharge into the Welsh Water network, capacity restricted to 5000 (capacity of the historic stand) until phosphate permit / discussions are complete and approval for additional capacity is accepted.	All foul water to be collected and discharged off site with no positive connection into the Welsh Water network.
Surface water drainage	Discharge to ground via infiltration. Strategy is the same as the existing site status with no positive connection to any sewer network / water courses.	No change to the existing site drainage where water hits the site and naturally infiltrates to the ground.

In drainage terms;

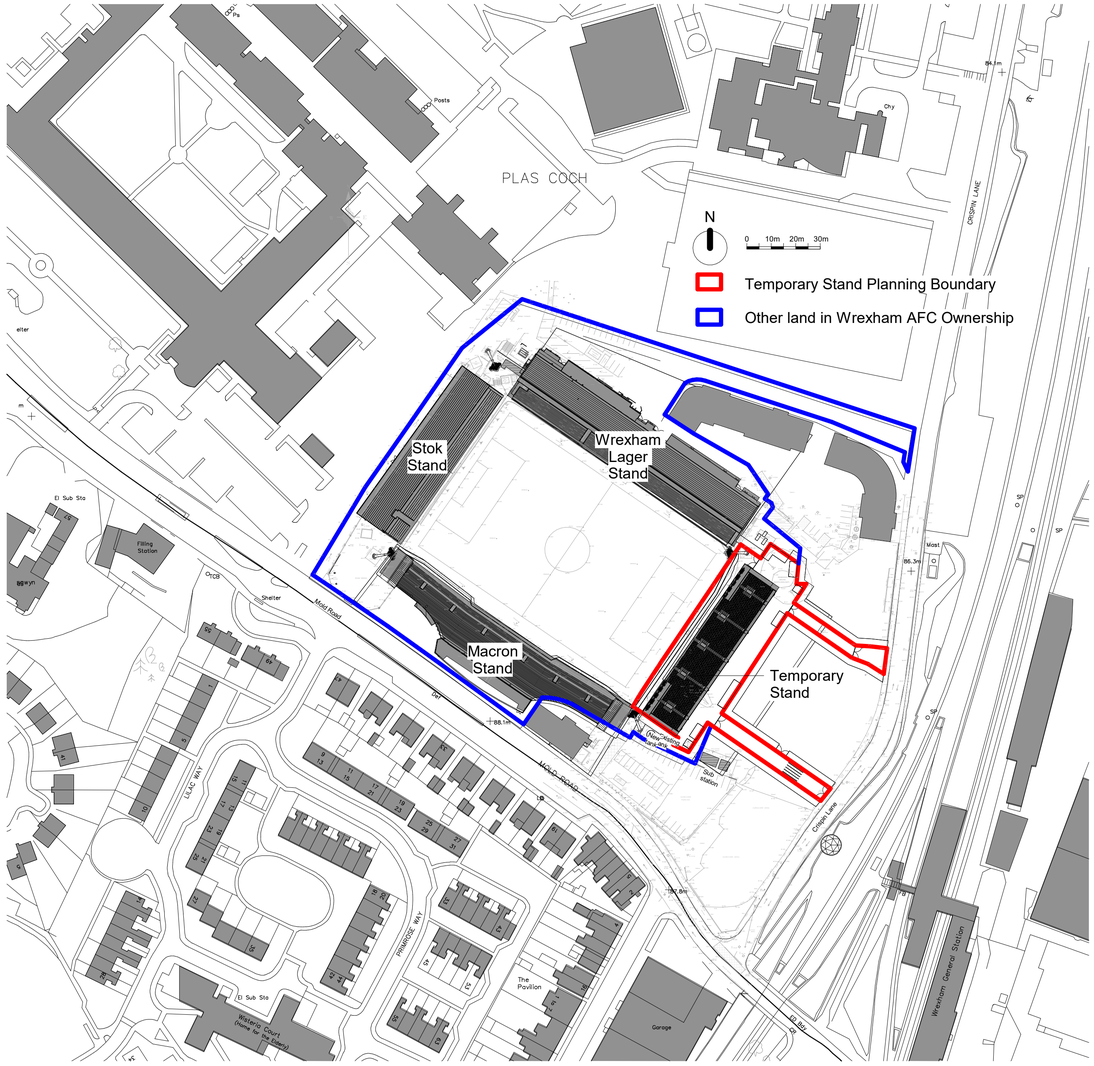
- Surface water - The temporary proposal does not change from the existing current site strategy with water hitting the surface and infiltrating to ground through the surface finishes. When the consented scheme is progressed the SuDS strategy will be employed.
- Foul water – The temporary proposal does not discharge to the Welsh Water network with no connection to be made until the consented development is constructed. The capacity of the temporary stand is 2711 less than the historic Kop, therefore foul loads will be significantly less than the old Kop.

For more information on the drainage strategy for the consented scheme please refer to "*WRX-RAM-XX-XX-RP-CD-00001*".

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Appendix 1 – Proposed Temporary Stand

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1 Temporary Seats Site Location Plan

1 : 1250

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P1 05.12.23 WR PLANNING ISSUE

rev no.	rev date	rev by	description

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Kop Development

location
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key plan

drawing title
Temporary Seats Site Location Plan

AFL job number	scale @ A1	drawn	checked
231547	1 : 1250	WR	JR

rev date 05.12.23

dwg purpose	status	rev
PLANNING	S2	P1

bim project origin zone level type role 5-digit no.
231547-AFL-ZZ-ZZ-DR-A-20000

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Temporary Stand Planning Boundary

Other land in Wrexham AFC Ownership

0 10m 20m 30m

N

Crispin Lane

85.3m

Wrexham Lager Stand

STOK Stand

Macron Stand

Temporary Sanitary Facilities

Proposed Temporary Stand

Temporary Sanitary Facilities

Mast

86.3m

SP

Shelter

Def

88.1m

MOLD ROAD

LB

New lane

Drop off/pick up

49

47

9 13

11 15

17 21

19 23

25 29

27 31

33

19

1 11

15 17

12 13

19

5

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P1 05.12.23 WR PLANNING ISSUE

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key plan

drawing title
Proposed Site Plan

AFL job number	scale @ A1	drawn	checked
231547	1 : 500	WR	JR

rev date 05.12.23

dwg purpose	status	rev
PLANNING	S2	P1

bim project origin zone level type role 5-digit no.
231547-AFL-Z4-00-DR-A-20001

1 Existing Site Plan Kop Development
1 : 500