Ref: M14.174(a).R.001

20th January 2016

RE: Phoenix Gymnastics Club, Fifiled Road, Fifield, Berkshire

This letter has been written to further clarify water management mater in respect of planning application ref: 15/02107/FULL for the proposed development of Phoenix Gymnastics Club, on land situated off Fifield Road, Fifield, Berkshire. It has been prepared by Pleydell Smithyman Limited, Environmental Design Consultants of Ironbridge, Shropshire.

Pleydell Smithyman Limited are experienced in the design of Sustainable Urban Drainage Systems (SuDS) and prepared the SuDS for the Phoenix Gymnastics Club proposals.

A letter dated 26th October 2015 was received from WSP Parsons Brinkerhoff which raised matters to be addressed in respect of the SuDS proposals and the potential for further flooding to be caused by development on the Fifield Road site. A series of points were raised where it was felt that further information was required. In order to fully address the comments raised by this letter, a detailed Flood Risk Assessment (FRA) was commissioned by Phoenix Gymnastics Club, and subsequently undertaken by Richard Laker of Hafren Water Ltd.

The FRA, produced by Hafren Water Ltd., assesses flood risk from Fluvial, Surface Water, Ground Water, and Sewer/Water Mains sources, and discusses mitigation in terms of the proposed SuDS.

Based upon borehole data prepared by BCL Consultant Hydrologists Limited, it is understood that much of the sites underlying geology is London Clay, providing an impermeable base with little/no ground water being present. Where ground water is assessed as being present, this is at a minimum depth of 2.5m, 1m below any proposed SuDS features. As such, the proposed SuDS presents a closed internal system with limited infiltration within the confines of the site, collecting, storing and directing water eastwards, where infiltration becomes possible, as clays move to sand and gravel (a permeable material). The proposed SuDS presents a staggered approach with water storage/collection being spread across the site, and flow between each point being varied. This slow release system will provide a natural mechanism for ensuring water quality, working with low gradients and flow rates. Soft landscaping has been used to supplement the system.

The FRA addresses surface water flood risk to the site, and due to the presence of existing drainage ditches and the raised bank along the eastern edge of Fifield Road, it is noted that surface waters will be prevented from entering the site. The scheme does not therefore need to be designed to account for this.

It was noted within the WSP Parsons Brinkerhoff letter that run-off calculations had previously been based on a 1 in 2 year greenfield run-off rate. These have since been revised through the preparation of the FRA. Run-off calculations have been produced for both the pre and post-development site, to allow for the 1 in 100 year

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flood event (plus 30% climate change), and a storm duration of 6 hours in accordance with the NPPF and CIRIA SuDS Manual.

The proposed SuDS has been designed to provide a total attenuation capacity of 2,246m³. The system was originally produced to provide attenuation for a building of 1,691m² for which it provided an over-designed approach with 1,366m³ of additional storage capacity, over and above the 880m³ that was calculated and agreed as being required. The Phoenix Gymnastics site proposals have since been reduced in scale with the revised layout now comprising a building with roof span of just 1,160m² and a reduction in the required car parking provision and associated hard landscaping, from 120 car parking spaces to 83. While the overall scale of the proposals has been reduced across the site, and soft landscaping has subsequently been increased, it is not proposed to alter the original SuDS design and principles. The only change in attenuation capacity is due to a reduction in the permeable sub-base replacement which has been reduced in parallel with the reduction of car parking facilities. The SuDS now provides a storage capacity 2,112m³, an over compensation of 1,420m³, over and above the newly calculated 692m³ required for the revised gymnasium proposals.

Through the design and assessment process, the proposed Phoenix Gymnastics Club site has been assessed as having the capacity to adequately meet the requirements to remove the threat of localised flooding, and in turn having the potential to improve the current situation for external receptors. The proposed SuDS provides clarity that a scheme can be implemented on site to provide more than three times the required attenuation capacity, while containing any potential for breach of water from the site. As demonstrated through the FRA, both pre and post-development surface water will be contained by the proposed SuDS, "reducing the risk of flooding to external receptors and increasing the capacity of drainage ditch D1" in turn "offering a significant betterment to external receptors. It is felt that where further information is required, that this should be conditioned as part of a planning consent for the site.

The site owner/occupier will be responsible for the on-going maintenance of the proposed SuDS scheme to ensure that it is kept clear and maintains its storage capacity and effectiveness.

Based upon the BCL baseline works and Hafren Water's assessment work of the proposed SuDS, the revised proposals will provide an over-designed solution for the Pheonix Gymnastics Club site and contain and manage water on site. There will be no additional pressure on the existing ditch network within the locality of the site and it is assessed that the scheme has the potential to in turn improve the current situation for external receptors. This has also been confirmed by further calculated assessment by Hafren Water Ltd. (Please see FRA ref: 2051-FRA vF1). We therefore consider that the revised scheme addresses the concerns raised by WSP Parsons Brinkerhoff, and provide the certainty required to permit the scheme in respect of water management matters, allowing the opportunity should it be required, for further detail to be produced through planning condition. It is noted that this is something that was initially stated in an email from the Flood Officer (FO) for the Royal Borough of Windsor and Maindenhead (RBWM) on 9th September 2015, where calculated greenfield run-off rates of 6.6 l/s and an attenuation storage volume of 880m³ were considered reasonable. Where further information was requested by the FO, this was submitted by way of additional drawing and specification works, and the preparation of the FRA. For peace of mind, this FRA also covered aspects relating to the FO's proposed conditions.

I trust this information is acceptable in support of these proposals.

Yours sincerely

For and on behalf of PLEYDELL SMITHYMAN LIMITED

Robin Smithyman *BSc (hons), PG DipLA, CMLI, PG DipTP, PG Dip UB, MIQ*

DIRECTOR

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Proposed SUDs Strategy - Principles

*A hydrological assessment of the proposed Phoenix Gymnastics Club masterplan layout has calculated a required water storage capacity of **692m³** in order to successfully manage a 1 in 100 year flood event.*

*The principles below set out a landscape engineered **SUDs strategy** to provide the neccessary water storage capacity on site.*

Ephemeral Pools & Swales

Surface landform works will take the form of a series of naturalistic pools of up to ~1.5m in depth with a maximum slope gradient of 1:3.

3N° swales to the southern boundary will direct run off over time to these pools utlising the natural gradient of the site (approx. 1:70). Water will be allowed to collect, sit and overflow at various junctions enabling water to naturally permeate along the course of flow.

Water on site will be directed towards a final water attenuation area/pond which has a holding capacity of 1,271m³. This has been placed above permeable ground to allow slow release. This level is above the calculated ground water based on borehole results. NB. The majority of the site is located on clay with a transition to sand and gravel at the northern area of the site.

Covering an area of 2,548m², the pools and swales combined will have a water storage capacity of ~1,798m³.

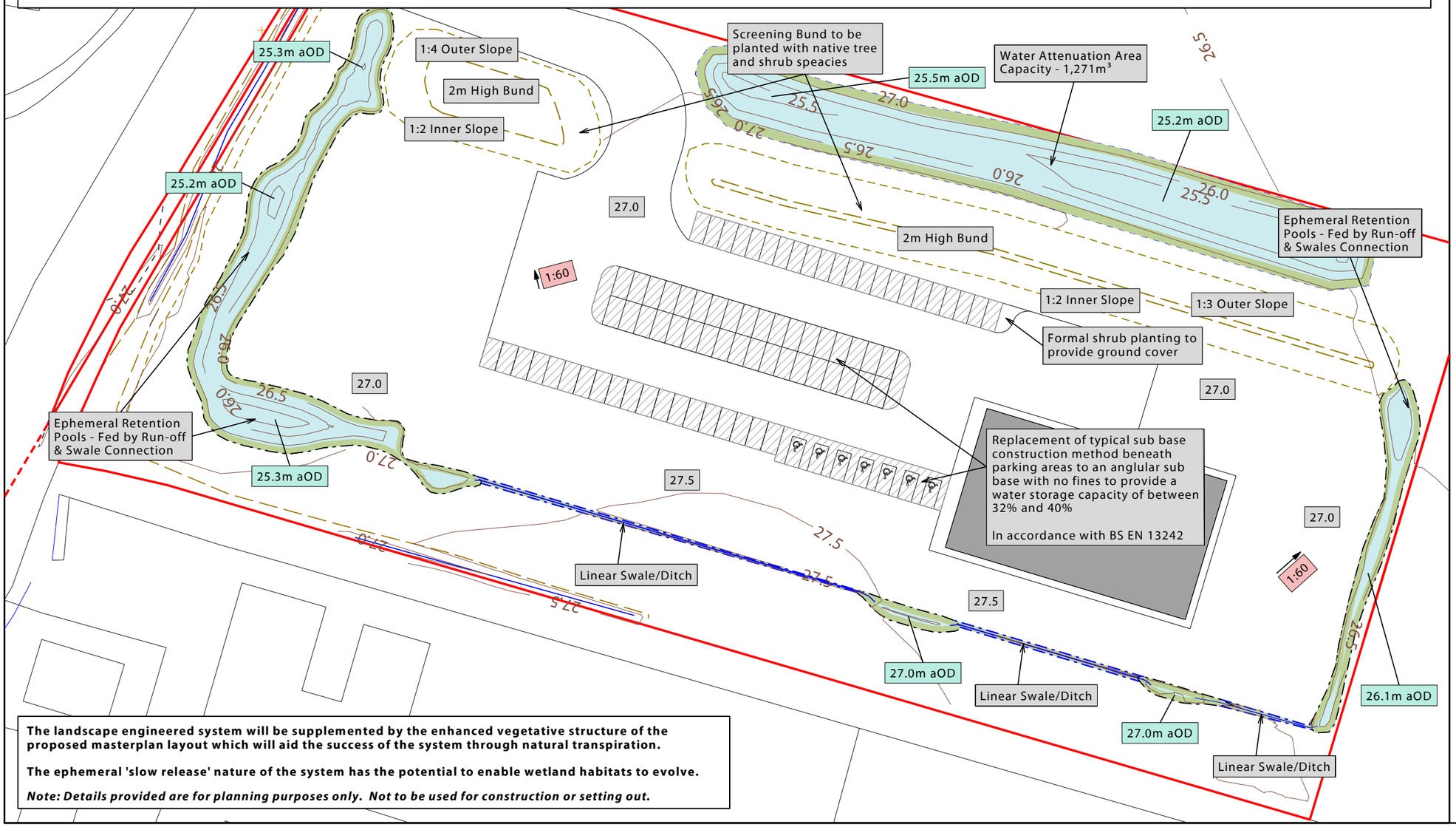
Replacement Sub Base

A replacement sub base will be applied to the construction of parking areas across the site to provide additional site water attenuation capacity. The typical sub base construction of the car park will be altered to provide a 0.8m thick sub base of angular granular material with NO fines (in accordance with BS EN 13242). This will create a storage void of 32% (minimum) and 40% (maximum) where water can slowly flow over time towards teh northern swale from where the collected runoff will dissipate into the ground water.

The sub base will be stabilised through the use of a GeoGrid between the sub grade and sub base to ensure that the particle structure is retained.

The replacement sub base areas will have a combined water storage capactity of 314m³ (minimum at 32% void)

The total combined water storage capacity of the site is therefore calculated at 2,112m³ i.e. over and above the required storage capacity of 692m³.



The landscape engineered system will be supplemented by the enhanced vegetative structure of the proposed masterplan layout which will aid the success of the system through natural transpiration.

The ephemeral 'slow release' nature of the system has the potential to enable wetland habitats to evolve.

Note: Details provided are for planning purposes only. Not to be used for construction or setting out.

Legend

- Potential Site Boundary (2.03 Hectares)
- Proposed Swale/Ditch
- Proposed Ephemeral Pools (Water Storage)
- Proposed Replacement Sub Base (Angular Granular Fill with NO Fines(to BS EN 13242)
- 27.5m aOD — Base of Swales & Pools
- 27.5m — Proposed Spot Levels
- 1:60 — Proposed Gradient

Note: Drawing to be read in conjunction with the Flood Risk Assessment (FRA) as supplied by Hafren Water (2051-FRA vF1)) and drawings M14.147(a).003a, .004 and .005a

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REV	AM'D	NOTES	DATE

DRAWING STATUS
PLANNING APPLICATION

PROJECT
Phoenix Gymnastics Club - Relocation

CLIENT
Phoenix Gymnastics Club

TITLE
SUDS Strategy Principles

DATE	SCALE
Jan 2016	**1:750@A3**
DRAWN **RGD**	CHECKED **RJS**

DRAW NO.
M14.174(a).D.001b

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Proposed SUDs Strategy - Directions of Flow

To ensure appropriate run off rates and to eliminate the potential for water to pool, a gradient of 1:60 will be applied to hard landscaping and parking areas. The slope directions will guide flow in a north easterly and north westerly direction.

Piped and surface drainage channels will maintain a minimum gradient of 1:100 to ensure water flows adequately through the system.

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Legend

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- Proposed Swale/Ditch
- Proposed Ephemeral Pools (Water Storage)
- Proposed Replacement Sub Base (Angular Granular Fill with NO Fines(to BS EN 13242)
- Ephemeral Swales/Ditches & Pools - Direction of Flow
- Sub Base Replacement - Submerged Permeable Pipe - Direction of Flow
- Surface Channel Drain - Direction of Flow
- French Drain - Direction of Flow
- Gymnastics Building - Downpipe Connection Point

Note: Drawing to be read in conjunction with the Flood Risk Assessment (FRA) as supplied by Hafren Water (2051-FRA vF1) and drawings M14.147(a).001b, .004 and .005a

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TITLE
SUDS Strategy Direction of Flow

DATE	SCALE
Jan 2016	**1:750@A3**
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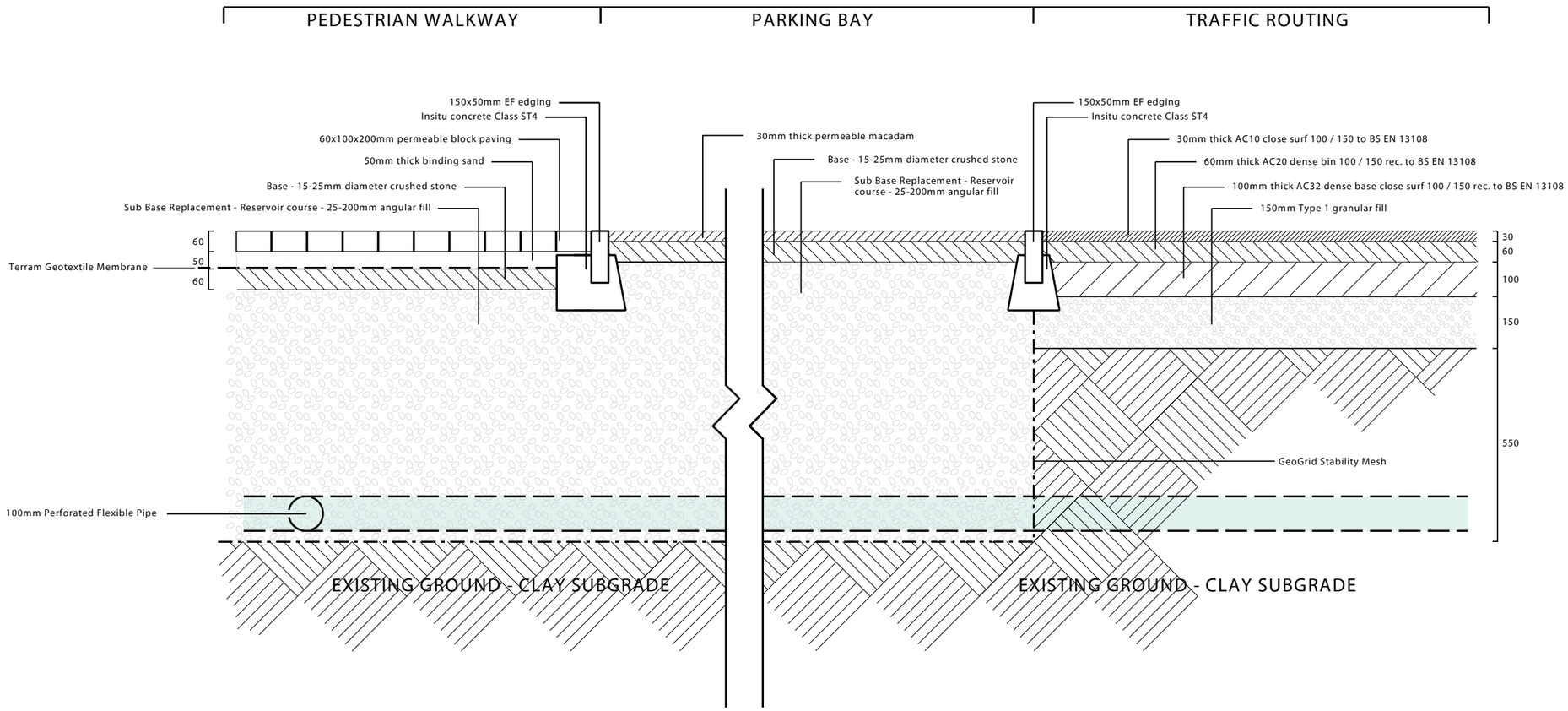
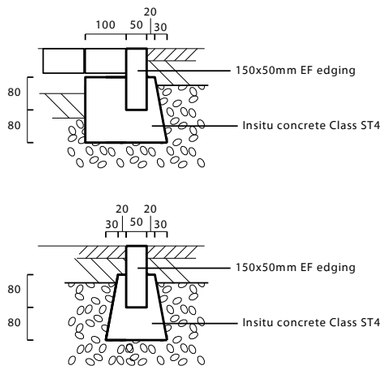
Proposed SUDs Strategy - Indicative Detailing

TYPICAL CROSS SECTION - Illustrating Replacement Sub Base within Car Parking Areas - to below specification or similar

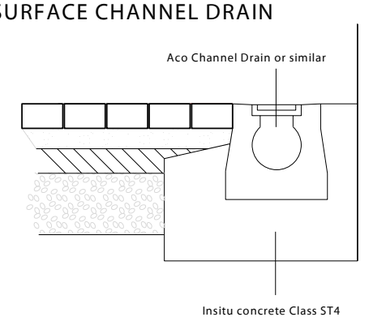


Outfall into the swale system would be via an outward opening hinged Vermin Grate (or similar) to ensure ease of maintenance.

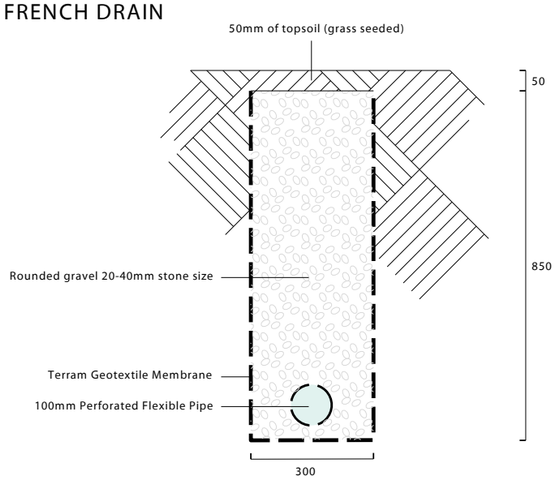
FLUSH KERB DETAILS



SURFACE CHANNEL DRAIN



FRENCH DRAIN



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TITLE
SUDS Strategy Indicative Detailing

DATE	SCALE
Sept 2015	**1:15@A3**
DRAWN **RGD**	CHECKED **RJS**

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