

FATS SCHEDULE 2 PROCUREMENT TASKING ORDER FORM

DRAFT

All conditions of the Framework Agreement FATS/4 shall apply as supplemented by the terms selected below.
The two together become a binding contract at the time of signature on the Schedule.

Tasking Identification

Tasking Order Number	OIP/00006 (Insert 9 characters Max)	Version No. & Date	
FATS Business Case Number	FBC 5246 (FATS team supplied)	Supplier Agreement Number	
Project / Equipment for which task is in support	OIP Expedient Surfaces	UOR	N/A
Title of Task	Rotary Wing Aircraft use of Expedient Surfaces		
BCA / NCAs Selected	NCA 3490 – Laboratory Testing (Soils and Water)		

Please refer to FATS Customer Guidance for definition of Work Category

IPT/Organisation Title	Operational Infrastructure Programme	Directorate /Operating Centre	
Sponsor::PT Leader/ Project Manager	Redacted s.40	Supplier Name	
Post	Requirements Manager (Special Tools & Equipment)	Post	
Address	Operational Infrastructure (OIP) Project Team	Address	
	DE&S #1309, Spruce 3b, Abbey Wood		
	Bristol		
Postcode	BS34 8JH	Postcode	
Telephone / Fax No:	Redacted s.40	Telephone / Fax No:	
E-mail	DESLEOSP-OIP-STE- ReqMgr@mod.uk	E-mail	

Urgent Operational Requirements (UOR's) - Timeframe for submission of proposals (for use only where the requirement is a UOR)

Working Days
N/A

Date Draft Tasking Order Issued

N/A

Deadline for Authority's receipt of Tenderer's response to the Draft Tasking Order

N/A

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1. Schedule of Requirements

Brief summary of requirement (full details appear below in the Statement of Requirement).

Item No	Description	Firm Price £ (Ex VAT)
1	Analyse and test forces associated with forces generated by RW aircraft on expedient surfaces as defined by the Statement of Works (SOW) at Appendix 1.	

☒ Continuation sheet attached (tick if appropriate)

See Appendix 1

STATEMENT OF REQUIREMENT

Customer Reference Number OIP/00006	Issue Number & Date	Supplier Reference Number
Task Title: Rotary Wing use of Expedient Surfaces.		
Brief Description of Task: 1. The scope of this task is to establish the safe working loads (SWL) for the 2 ES in the OIP catalogue, Preformed Surface Aluminium (PSA) and Aircraft matting 2 (AM2). Touch Down Points (TDPs) are assumed to be constructed in accordance with AESPs in a 15m x 15m and 30m x 30m configuration on ground of a CBR of 4% - 15%. The SWL should be assessed under conditions experienced during landing, point take-off, running take-off and taxiing.		
Background/Justification: Expedient Surfaces (ES) have been used for many years to create temporary Touch Down Points (TDPs) for Rotary Wing (RW) aircraft and taxi ways and runways for Vertical/Short Take Off and Landing (V/STOL) Fixed Wing (FW) aircraft. However, since the types of ES available were not specifically designed or approved for RW use, concerns surrounding their safety have been raised. The risk is therefore not properly understood and as such cannot be considered to be As Low As Reasonably Practicable (ALARP).		
Activities to be Undertaken: Summary of tasks below, details are at Annex D to this document <ul style="list-style-type: none"> Analyse forces generated by Rotary Wing Aircraft (RW Ac) during taxiing, take off and landing. Analyse and test pin pull out forces for a range soils with a CBR of 4 -15%. Establish the Safe Work Load (SWL) for AM2 and PSA. Provide planning data for users and maintainers for inclusion in the AESP. Provide evidence to support the safety panel endorsement of the safety case for ES. 		
Deliverables: Technical Report, supporting data, analysis and assumptions and a summary presentation to allow the Rotary Wing Expedient Surfaces Safety Panel to make an informed decision on the use of PSA and AM2 as TDPs.		
Government Furnished Assets: AMS and PSA expedient surfaces.	Performance Targets:	
Additional Quality Requirements & Standards: See AOF Quality Assurance Website: www.aof.dii.r.mil.uk/aofcontent/tactical/ppm/content/quality.htm	Timescale/Completion Date:	
Sponsor details: <i>Redacted s.40</i>		
Signature: [Electronically Signed]		Date: 06 Feb 2015

DETAILED STATEMENT OF REQUIREMENT ATTACHED ☒

2. Order Conditions

All conditions of the Framework Agreement will apply as supplemented by the choice of terms below:

General Conditions – select as appropriate			
These Schedule 1 Conditions will not apply <i>List all Schedule 1 conditions that will not apply to this Tasking Order</i>			
DEFCON 614 – Default	<input checked="" type="checkbox"/>	DEFCON 92 – Failure of Performance (applicable to research, development, design or study. In all other cases DEFCON 614 will apply)	<input type="checkbox"/>
DEFCON 624 – Use of Asbestos in Arms, Munitions or War Materials	<input type="checkbox"/>	DEFCON 603 – Aircraft Integration and Clearance Procedure	<input type="checkbox"/>
DEFCON 176A - MOD Requirements For Competition In Subcontracting (Non-Competitive Main Contract)	<input type="checkbox"/>	DEFCON 622 - Enabling Contracts - Repair Turn Around Times	<input type="checkbox"/>
DEFCON 637 - Defect Investigation And Liability	<input type="checkbox"/>	Additional Conditions <i>A sheet is to be attached detailing any conditions that have been added</i>	<input type="checkbox"/>

Special Indemnity Conditions – select as appropriate	
DEFCON 661 – War Risk Indemnity	<input type="checkbox"/>
DEFCON 661A – War Indemnity Risk (Alternative Version)	<input type="checkbox"/>
DEFCON 684 – Limitation upon Claim in Respect of Aviation Products	<input type="checkbox"/>
DEFCON 76 – Contractors Personnel at Government Establishments If, in accordance with Clause 4 of DEFCON 76, a Limit of Liability has been agreed, it is to be identified in the attached Annex A Statement of Requirement	<input type="checkbox"/>

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Type of Contract	
Competitive	<input checked="" type="checkbox"/>
Competitive Award Criteria and Weightings	Most Economically Advantageous Tender
Single Source	<input type="checkbox"/>

Delivery/Rejection/Acceptance	
Specific delivery requirement	In Accordance with Attached Key Deliverables Document
Specific rejection criteria	In Accordance with Attached Key Deliverables Document
Specific acceptance requirement	In Accordance with Attached Key Deliverables Document

Pricing Conditions Required – select appropriate method of pricing	
Firm Priced at Outset (this should be ticked for all competitions, and other than by exception, for the majority of single source work).	<input checked="" type="checkbox"/>
If other than Firm Priced at Outset. Include additional conditions in attachment.	<input type="checkbox"/>

Payment Terms – select as appropriate			
Payment by P2P If ticked then DEFCON 5J, DEFCON 129J, DEFCON 522J, DEFFORM 30 (Compliance with the Electronic Transactions Agreement) apply.			<input checked="" type="checkbox"/>
DEFCON 522 – Payment (If applicable attach completed Form 522A)	<input type="checkbox"/>	DEFCON 693 – Government Procurement Card	<input type="checkbox"/>
Payment on completion	<input type="checkbox"/>	Milestone/Stage Payments (see DEFCON 649 below)	<input checked="" type="checkbox"/>
DEFCON 649 – Vesting (applicable to Tasks with deliverables where provision has been made for milestone payments in advance of completion)			<input checked="" type="checkbox"/>
Alternative Payment Arrangements Required Where payment cannot be made through the MoD invoice payment department (e.g. for tasks placed by other Government departments), please provide full details of the payment procedure to be followed, as an attachment to this tasking form.			<input type="checkbox"/>

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Milestone / Stage Payments

The following deliverable(s) have been selected as significant events in the programme attracting payment to the value shown, on the date(s) given below:

Milestone/ Stage No	Title or description	Due Date	%	Value £k (ex VAT)
1				
2				
3				
Final				

☐ Continuation sheet attached (tick if appropriate)

Final payment should be subject to a reasonable retention based on a percentage of the total cost of the Task

Intellectual Property Rights

Completion of this section is **mandatory**.

Select the appropriate condition(s) by ticking the boxes below.

Before completing, ensure that reference is made to Clause 24 of Schedule 1 to the Framework Agreement for the circumstances for use of each DEFCON. If all of the work is under DEFCON 705 or 703 then tick only one box. If separate line items fall into different boxes then both boxes should be ticked and an indication given as to which line item falls within each respective box)

In the event that no boxes are ticked in this section (Intellectual Property Rights), all intellectual property generated under the Task shall be subject to the terms of DEFCON 703.

DEFCON	Tick (As Applicable)	Tasking Order Line Item (tick as appropriate)	
DEFCON 705	<input type="checkbox"/>	All <input type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)
DEFCON 703	<input checked="" type="checkbox"/>	All <input checked="" type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)
DEFCON 14, 15, 21, 126 & DEFFORM 315	<input type="checkbox"/>	All <input type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)
DEFCON 14, 16, 21 & DEFFORM 315	<input type="checkbox"/>	All <input type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)
DEFCON 14, 90 & 126	<input type="checkbox"/>	All <input type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)

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DEFCON 14, 91 & 126	<input type="checkbox"/>	All <input type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)
Other, as specified in a special IPR condition to be applied to the Tasking Order	<input type="checkbox"/>	All <input type="checkbox"/>	<input type="checkbox"/> The following Item Nos. only (insert below)
No intellectual property conditions apply (<i>refer to DIPR before ticking this box</i>).	<input type="checkbox"/>		

Note: Each DEFCON or DEFFORM as applied to a Tasking Order shall be in its latest Edition published before that Order is placed, unless otherwise stated in the Order.

Issue of Government Stores – select all applicable			
DEFCON 23 * – Special Jigs, Tooling and Test Equipment	<input type="checkbox"/>	DEFCON 611 – Issued Property (if ticked then list Issued Property and attach list to Tasking Form).	<input checked="" type="checkbox"/>
DEFCON 601 – Redundant Material	<input type="checkbox"/>	DEFCON 694 – Accounting for Property of the Authority	<input checked="" type="checkbox"/>

Controlled Information		
Issue of Controlled Information subject to Schedule 1, clause 20	Select if applicable (if ticked then list Controlled Information and attach list to Tasking Form).	<input type="checkbox"/>

Payment of Customs Duty – select one box only			
DEFCON 619A - Customs Duty Drawback	<input type="checkbox"/>	Issue of Certificate in accordance with EU (Council) Regulation 150/2003	<input type="checkbox"/>

Progress Reports required (Schedule 1 Clause 2)					
If ticked, progress reports must utilise the current version of DRRS Format Standards for Scientific and Technical Reports Prepared for the United Kingdom Ministry of Defence.	<input checked="" type="checkbox"/>	DEFCON 642 – Progress Meetings	<input type="checkbox"/>	Frequency	See below
Brief Description	Contract Start Up and Close Down Meeting				

Transport – select one box only			
DEFCON 621A – Transport (if the Authority is responsible for transport)	<input checked="" type="checkbox"/>	DEFCON 621B – Transport (if the Contractor is responsible for transport)	<input type="checkbox"/>

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Liquidated Damages applicable? (Condition 21 of Schedule 1 applies)			<input type="checkbox"/>
Task Item 1	£	per day up to a maximum of £	
Task Item 2	£	per day up to a maximum of £	
Task Item 3	£	per day up to a maximum of £	
Task Item 4	£	per day up to a maximum of £	
Task Item 5	£	per day up to a maximum of £	
<i>(repeat as required)</i>			
Force Majeure Maximum period of extension of time in the case of a Force Majeure event			

Quality Assurance Conditions According to the product or scope of the work to be carried out, the Contractor shall meet the requirements of:			
AQAP 2110 – NATO Quality Assurance Requirements for Design, Development and Production			<input type="checkbox"/>
Deliverable Quality Plan requirements			
DEFCON 602A - Quality Assurance with Quality Plan	<input type="checkbox"/>	DEFCON 602B - Quality Assurance without Quality Plan	<input checked="" type="checkbox"/>
AQAP 2105 – NATO Requirements for Delivering Quality Plans			<input type="checkbox"/>
Software Quality Assurance requirements			
AQAP 2210 – NATO Supplementary Software Quality Assurance Requirements to AQAP 2110			<input type="checkbox"/>
Air Environment Quality Assurance requirements			
DEFCON 638 – Flights Liability and Indemnity			<input type="checkbox"/>
Def. Stan. 05-100 – Ministry of Defence Requirements for Certification of Aircraft for Authorised Flight and Ground Running (Mandatory where flying and/or ground running of issued aircraft is a requirement of the Task)			<input type="checkbox"/>
All relevant MAA Regulatory Publications			<input type="checkbox"/>
Additional Quality Requirements			<input type="checkbox"/>
<i>See attachment</i>			

Warranty	
Note: In the absence of any express warranty in this Tasking Order, remedies implied by General Law will apply.	

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Security	
DEFCON 659 – Security Measures Note: Applies to all contracts classified 'Confidential' or above to be placed with a UK Contractor. DEFCON 659 does not apply to contracts to be placed with Overseas Contractors.	<input type="checkbox"/>
Overseas Contractor – Attach appropriate Security Aspects Letter	<input type="checkbox"/>

The edition and all amendments to the above referenced requirements current at the date of tender or contract/order shall pertain, unless a specific edition is indicated.

1. **GENERAL CONDITIONS**

DEFCON515 Edn 10/2004 Bankruptcy and Insolvency

DEFCON501 Edn 03/2015 Definitions and Interpretations

DEFCON520 Edn 07/2011 Corrupt Gifts and Payments of Commission

DEFCON516 Edn 04/2012 Equality

DEFCON656 Edn 03/2006 Break

3. **Dates for the Commencement and Completion of the Work**

Commencement Date: Upon Contract Award	Delivery/Completion Date 30/11/2015
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NOTE TO CUSTOMER COMMERCIAL OFFICER: FOR A DRAFT TASKING ORDER, ENSURE THAT THE STATEMENT OF REQUIREMENTS HAS BEEN COMPLETED. DO NOT COMPLETE THE SECTION ON MILESTONE/STAGE PAYMENTS AND PARAGRAPHS 5 TO PARAGRAPH 7. THESE SECTIONS (AND ANNEX C WHERE APPLICABLE) SHOULD ONLY BE COMPLETED FOR A FINAL TASKING ORDER, OR WHERE AN AMENDMENT HAS BEEN MADE TO THE FINAL TASKING ORDER.

4. **Record of Authorised Changes [See Note A]**

CHANGE ISSUE NUMBER	DATE OF ISSUE	COMMENTS / REASON FOR CHANGE

5. **Price [Note B]**

CONTRACT PRICE	TYPE OF PRICING
30240	Firm

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6. Commercial Officer Authorisation

Name	Redacted s.40		
Position	DES LE OSP-OIP Comrcl1b1		
Signature			
Date	07/09/2015	Telephone Number	Redacted s.40

Please note that approval may only be granted by a Commercial Officer who holds an appropriate commercial licence, or his nominated representative (to whom commercial signing powers have been delegated).

7. Acknowledgement of order [Note C]

Approval	Position	Signature:	Date
Acknowledgement by (Supplier)			

8. Notes (Instructions to Customers and Suppliers)

(A) The date and issue number must be raised incrementally whenever the order is reissued; additionally the "Record of Authorised Changes" section should be completed as appropriate.

(B) The Contractor shall provide full pricing details on the pricing basis requested by the Authority including a price breakdown

(C) The Contractor must return a signed copy to the Authority within 10 Working Days in acknowledgement of receipt of the final Tasking Order placed with it by the Authority under the Framework Agreement.

(D) Where the output of any Research or Study is a Technical Report, the Report is to be completed in accordance with the current version of the ATHENA Defence Research Reports Specification - 'Format Standards for Scientific and Technical Reports Prepared for the United Kingdom Ministry of Defence'. MOD Customers may obtain this document via the www.dstl.gov.uk. The Contractor shall send a copy of the report on CD ROM in unlocked pdf.format to:

Dstl Knowledge & Information Services,
Bldg 247,
Dstl Porton Down,
Salisbury
Wilts SP4 0JQ.
Tel: 01980 613971

Any staff on DII can search the ATHENA system via the online science gateway to ascertain if particular research or a study already exists. Access can be requested utilising a [password \(supplied\)](#) via this link: <http://osg.dstl.r.mil.uk/SignIn/SignIn.aspx/>

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(E) ON RECEIPT OF THE ORDER ACKNOWLEDGEMENT FROM THE CONTRACTOR, THE AUTHORITY'S COMMERCIAL BRANCH MUST SEND A COPY OF THE ACKNOWLEDGED FINAL TASKING FORM TOGETHER WITH A COMPLETED DEFFORM 57 AND DEFFORM 111 (Edn 05/11) TO:

DGFM-FMSSC
Walker House, Exchange Flags, Liverpool, L2 3YL

(F) A COPY OF THE ACKNOWLEDGED FINAL TASKING FORM MUST BE SENT BY THE AUTHORITY'S COMMERCIAL BRANCH ELECTRONICALLY TO THE FATS TEAM (AT THE FOLLOWING ADDRESS:

DESCmrclCC-FATS1b@mod.uk

HOWEVER IF THIS IS NOT POSSIBLE PLEASE SEND HARD COPY TO:

DES Comrcl CC/FATS 1b, #2218, Poplar Level 2, Abbey Wood South
Bristol, BS34 8JH

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DEFFORM 111
(Edn 04/15)

Appendix A - Addresses and Other Information

1. Commercial Officer

Redacted s.40

2. Project Manager, Equipment Support Manager or PT Leader (from whom technical information is available)

Redacted s.40

3. Packaging Design Authority

(Where no address is shown please contact the Project Team in Box 2)

4. (a) Supply / Support Management Branch or Order Manager:

See Box 2

(b) U.I.N. PO602A

5. Drawings/Specifications are available from

See Box 2

6. For contracts containing DEFCON 5, mauve Copies of MOD Form 640 are to be sent to

(where no address is shown the mauve copy should be destroyed)

7. Quality Assurance Representative:

Commercial staff are reminded that all Quality Assurance requirements should be listed under the General Contract Conditions.

AQAPS and DEF STANs are available from UK Defence Standardization, for access to the documents and details of the helpdesk visit <http://dstan.uwh.dif.r.mil.uk/> [intranet] or <https://www.dstan.mod.uk/> [extranet, registration needed].

8. Public Accounting Authority

1. Returns under DEFCON 694 (or SC equivalent) should be sent to DBS Finance ADMT – Assets In Industry 1, Level 4 Piccadilly Gate, Store Street, Manchester, M1 2WD ☎ 44 (0) 161 233 5397

2. For all other enquiries contact DES Fin FA-AMET Policy, Level 4 Piccadilly Gate, Store Street, Manchester, M1 2WD ☎ 44 (0) 161 233 5394

9. Consignment Instructions

The items are to be consigned as follows:

10. Transport. The appropriate Ministry of Defence Transport Offices are:

A. DSCOM, DE&S, DSCOM, MoD Abbey Wood, Cedar 3c, Mail Point 3351, BRISTOL BS34 8JH

Air Freight Centre

IMPORTS ☎ 030 679 81113 / 81114 Fax 0117 913 8943

EXPORTS ☎ 030 679 81113 / 81114 Fax 0117 913 8943

Surface Freight Centre

IMPORTS ☎ 030 679 81129 / 81133 / 81138 Fax 0117 913 8946

EXPORTS ☎ 030 679 81129 / 81133 / 81138 Fax 0117 913 8946

B. JSCS

JSCS Helpdesk No. 01869 256052 (select option 2, then option 3)

JSCS Fax No. 01869 256837

www.freightcollection.com

11. The Invoice Paying Authority (see Note 1)

Ministry of Defence ☎ 0151-242-2000

DBS Finance

Walker House, Exchange Flags

Fax: 0151-

242-2809

Liverpool, L2 3YL

Website is:

<https://www.gov.uk/government/organisations/ministry-of-defence/about/procurement#invoice-processing>

12. Forms and Documentation are available through *:

Ministry of Defence, Forms and Pubs Commodity Management PO Box 2, Building C16, C Site

Lower Arncliffe

Bicester, OX25 1LP (Tel. 01869 256197 Fax: 01869 256824)

Applications via fax or email: [DESLCSLS-](mailto:DESLCSLS-OpsFormsandPubs@mod.uk)

OpsFormsandPubs@mod.uk

NOTES

1. Forms. Hard copies, including MOD Form 640 are available from address in Box 12., All other invoicing forms e.g. AG Forms 169 and 173, are available from the website address shown at Box 11.

2.* Many DEFCONs and DEFFORMs can be obtained from the MOD Internet Site:

<https://www.aof.mod.uk/aofcontent/tactical/toolkit/index.htm>

For Official Use Only Recoverable YES ☒ NO ☐

Issue of Government Property YES ☐ NO ☒

VAT Contractor - Country of Origin (delete those not applicable)

Finance Branch OSP-OIP

RAC / LPC No / Project No NPD004

Requisition No

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<div>UK X</div>	<div>Non-UK (non-EU Country)</div>	<div>Non-UK (EU Country)</div>	<div>Project Management/ Production branch reference</div>	<div>OIP/00006</div>
<div>If EU specify country:</div> <div></div>			<div>Place of manufacture</div>	<div></div>
<div>Outside the scope</div>	<div></div>	<div>Item Nos</div>	<div>Place of packaging</div>	<div></div>
<div>Exempt</div>	<div></div>	<div>Item Nos</div>	<div>Contractor's Tel No</div>	<div></div>
<div>Taxable Zero Rate</div>	<div></div>	<div>Item Nos</div>		
<div>Taxable - Standard Rate</div>	<div></div>	<div>Item Nos</div>		

(where a contract is with a contractor whose place of business is not the UK, JSP 916 should be consulted)

Framework Agreement for Technical Support

Part 2 – Quotation for Sole Source Tasks

ANNEX B TO FATS TASKING FORM

Framework Agreement for Technical Support

Part 2 – Quotation for Sole Source Tasks

1. To:	From:
In response to your request for a quotation reference FTS4 /	Date: Dated
*The work can be undertaken and our detailed response is attached. <input type="checkbox"/>	
*We are unable to provide the resources/deliverables identified on this occasion. <input type="checkbox"/>	
(* Check box as appropriate)	
Signed: Date:	Name: (Block Capitals)

2.	Task title (as shown in the tasking form):
3.	Contractors Reference:
4.	<div style="display: flex; justify-content: space-between;"> Start Date: Completion Date: </div>

5a. Manpower Broad Area of Capability No.	Grade	Firm Hourly Labour Rate	No. of Hours	Total

5b. Travel	Unit cost	Number of Journeys / Miles	Total
<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> Rail Motor Mileage Air Sea </div> <div style="width: 60%;"> <i>Redacted s.41</i> </div> </div>			

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5c. Subsistence		Cost
	(Estimated expenditure on)	
	Accommodation	
	Meals	
	Misc. (Please State)	The above T&S costs relate to the period to
5d.Other Costs	Sub-contractor Price:	
	Sub-Contractor Details:	
	Other (Please State):	
	Description	Cost
Total Price		(excl. VAT)

Management Information (For Official MoD use only)

Please note that Management Information page should only be completed on placement of the task. Please complete all fields.

<u>Task Number</u>	<u>Supplier Name</u>	<u>Supplier Number</u>	<u>CPV Code</u>
_____	_____	_____	71356000 Technical services <input type="checkbox"/>
			71356300 Technical support services <input type="checkbox"/>

Organisation Details

TLB	2* Area (DES)	PT / Business Unit

Task Details

Task Value (£)

Materials element (£)

Subsistence element (£)

Profit (£)

Start Date.

End Date

RAC (See Chart of Accounts for FATS 4 RAC codes)

UIN

Length of Task (Months)

Length of Task in Man Hours.(Number of manhours that have been procured) (note cumulative if more than 1 person)

Number of personnel employed

Procurement Type.

Reason for Single Source (if Applicable)

Competition		Single Source	
Reason for Single Source (if Applicable)			

Spend Profile

Forecast of Outturn for task

2012/13	2013/14	2014/15	2015/16	2016/17

Annex D

Reference

- A. AESP 5680-D-100-101
- B. AESP 5680-D-250-201

Introduction

2. Expedient Surfaces (ES) have been used for many years to create temporary Touch Down Points (TDPs) for Rotary Wing (RW) aircraft and taxi ways and runways for Vertical/Short Take Off and Landing (V/STOL) Fixed Wing (FW) aircraft. However, since the types of ES available were not specifically designed or approved for RW use, concerns surrounding their safety have been raised. The risk is therefore not properly understood and as such cannot be considered to be As Low As Reasonably Practicable (ALARP).

General

3. The Operational Infrastructure Programme (OIP) manages a range of ES products that are used to create temporary TDPs and/or taxiways and runways. The purpose of this task is to analyse the loads exerted on the ES during RW operations in order to establish the maximum safe working loads of the ES and to update the AESPs accordingly.

4. A design for a TDPs produced by 12 (Air Support) Engineer Group has been endorsed at the ES Safety Panel on 17 Mar 14, see Ref A. However it was highlighted at this safety panel that the AESPs at Refs B and C do not provide sufficient guidance as to the maximum point loading and down wash force to allow each ES type to be operated safely. These loads affect the number and type of pins used to anchor the ES in place on a range of soil types, compositions and California Bearing Ratios¹ (CBR).

5. Without this data, and the supporting analysis, the user does not have sufficient information to allow them to establish, operate and maintain ES TDPs in a safe manner. In addition the risk of RW use of ES cannot be considered ALARP until analysis and parameters for ES use have been defined.

Scope

6. The scope of this task is to establish the safe working loads (SWL) for the 2 ES in the OIP catalogue. TDPs are assumed to be constructed in accordance with Ref B and C in a 15m x 15m and 30m x 30m configuration on ground of a CBR of 4% - 15%. The SWL should be assessed under conditions experienced during landing, point take-off, running take-off and taxiing. ES within scope of this research are as follows: -

- a. Mat Set, Ground Surfacing - Preformed Surface Aluminium (PSA)
- b. Airfield Matting AM-2.

Outcomes

¹ **BS 1377 - California bearing ratio (CBR)** - The ratio (expressed as a percentage) of the force required to cause a circular piston of 1935 mm² cross-sectional area to penetrate the soil from the surface at a constant rate of 1 mm/min, to the force required for similar penetration into a standard sample of crushed rock. The ratio is determined at penetrations of 2.5 mm and 5.0 mm, and the higher value is used.

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7. The outcomes of this task fall within 3 areas; quantifying the safe working loads that each ES can operate up to, providing the RW ES safety Panel with evidence to endorse the use of ES and provide the user with planning information and parameters for each ES.

a. **Safe Working Loads.** RW aircraft generate a significant force from both physical contacts with the ES with aircraft undercarriage during landing, running take off and taxiing and from the down wash created from the rotor(s). The effects of these forces are 2 fold. Firstly a point load is generated by the undercarriage in contact with the ES potentially bending and permanently distorting the panels and secondly the force from rotor downwash can peel and lift the ES. Both of these mechanisms of failure have the potential to loosen or detach panels or parts thereof and damage aircraft. This task needs to establish the SWL, in terms of point loading and down wash, when each of these forces is experienced in isolation and in combination. The various pin length configuration and CBRs of the ground will need to be included as variables to establish the SWL for a range of ground condition likely to be experienced. At present the force required to loosen or lift a securing pin is not understood in detail and has a significant effect on the SWL of the ES.

b. **Safety Panel Endorsement.** The RW ES Safety Panel is responsible for management of safety for ES used by RW. As such it is the panel's responsibility to ensure that they understand the risks involved and are satisfied that they have sufficient evidence to manage the risk and ensure it is ALARP. In order to satisfy this requirement it is necessary for this task to have investigated as far as possible the risks associated with operating RW from ES TDPs. This evidence will allow the panel to make an informed decision, manage the risk appropriately and ensure that ES TDPs are established, operated and maintained in a safe manner.

c. **AESP Update.** The user needs planning information, data and parameters pertinent to establishing, operating and maintaining ES TDPs. The outcomes of the analysis need to be produced in a format that can be incorporated into the AESPs at Ref B and C. The SWL for each ES type needs to be quantified to provide an envelope for safe operation to allow for use by a variety of aircraft types and accommodate changes to existing platforms; rather than specifying what airframes can use each ES type under what situation. It is also envisaged that the data should be presented in a look-up table to allow for rapid decision making during construction of TDPs by SMEs.

d. Key data for operating parameters and look-up table is as follows: -

- i. **SWL** – Point loading.
- ii. **SWL** – Down wash.
- iii. **CBR Range.**
- iv. **Pin Type/Length/Quantity.**

e. An example of the format for this look-up table is as follows, however this is illustrative only and should not restrict other formats.

CBR	Configuration	Down Wash	Point Loading	Ground/Soil type
4 - a%	X Pins, Long	Y KN	Z KN	E.g. Dry Sand/Soil
b - c %	X Pins, Long	Y KN	Z KN	E.g. Wet Soil
~	~	~	~	~
≤15%	X Pins, Short	Y KN	Z KN	E.g. Loose Gravel

Information/Deliverables

PROTECT – COMMERCIAL

8. The outputs of this task will be used to support endorsement of ES for use by RW, ensure the risk is known and ALARP, and used to update planning figures in the AESPs. As such the outputs are required in several formats and levels of technical content as detailed below: -

- a. **Technical Report.** The technical report is aimed at the SME audience who have detailed understanding of RW operation but may not necessarily have detailed knowledge of specific subject areas. The technical report will be used to provide evidence to allow the Safety Panel to make an informed decision over endorsement of ES for RW. The report will also provide the basis for an update to the AESP and should contain planning assumptions, pertinent data and look-up tables where appropriate, that can be incorporated directly in AESP amendments. The report may contain detailed recommendations, outputs from analytical tools and any other form of illustration, diagram or graph as applicable. The report should be available in hard copy and soft copy.
- b. **Supporting Data and Assumptions.** All data, assumptions, supporting material and any other information used to provide recommendations or support findings should be available to OIP Engineering Team. This will allow the information to be used to inform future decision making and allow further research into specific areas. This information can be in raw, un-processed form in any applicable format accessible via DII(F) (inc Microsoft Visio, Adobe or any by request software packages) in both hard and soft copy.
- c. **Summary Presentation.** The presentation is aimed at an internal and external audience of a varied range of knowledge and experience. The presentation will be used by members of the OIP Engineering Team to inform the stakeholder community, influence decision making and behaviours. It should provide a general overview of the analysis of RW use of ES; provide a background to the research focusing on the recommendations and key finding with the minimal amount of detailed information to support these. The presentation need only be available in soft copy.