



# Shropshire

## Fire and Rescue Service

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**Brigade Order  
Operations  
7**

**Part 7**

**Urban search  
and rescue**

Reference

Author

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Date

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08/07

## Part 7 – Urban search and rescue

### Purpose

The purpose of this order is to outline information and the procedures to be adopted when operating at incidents involving structural collapse where local, regional and national urban search and rescue procedures need to be adopted.

### Strategic aims and objectives

This Brigade Order supports the following strategic aims :

Strategic aim 1 “Reduce the risk to life and material loss from fire, road traffic collisions and other emergencies in the community”

Strategic aim 2 “Protect life, property and the environment from fire and other emergencies

Strategic aim 3 “ Secure the highest level of safety and welfare for all staff and Authority members by providing effective leadership, training, equipment and systems of work

### Roles, responsibilities and review

The **Head of Operations** is responsible for ensuring this Order is implemented across the Brigade.

**Incident Commanders** will be responsible for the day to day operation of the Order.

The **Head of Operations** will review this Order biennially in June and when organisational changes take place.

## **Introduction**

Building or structural collapse can happen anywhere at any time, the risk of it happening in Shropshire is impossible to predict. The primary role of the Fire and Rescue Service at an incident involving a collapsed structure is extinguish fires and search for and rescue casualties

As part of the Government led initiative under the New Dimension Project, Fire and Rescue Services around the country have been supplied with equipment in order to allow fire crews to operate effectively when dealing with Urban Search and Rescue (USAR) incidents such as building collapse. Within our region there are 2 brigades that have equipment and staff to deal with incidents of this type, they are the West Midlands and Hereford and Worcester. (See appendix A for more information)

To allow Shropshire Fire and Rescue Service to be able to stabilise a USAR incident, the Rescue Tender based at Wellington has specialist equipment and has crews trained to initiate interim measures prior to the arrival of dedicated USAR teams.

## **Causes of USAR incidents**

The purpose of USAR is to give Fire and Rescue Services the ability to respond to any incident that involves persons being trapped in collapsed structures. This could involve buildings, mine workings, land slides and trenches.

Possible causes of structural collapse are as follows:

- Terrorist attack
- Structural failure
- Earthquake
- Fire
- Gas explosion
- Weather induced (high winds, flood, and land slide)
- Human error

Some of these incidents may be very small and will be able to be dealt with locally with our own resources; other incidents will require us to draw upon regional and even national resources.

## **Mobilisation**

Due to the complexity of USAR incidents the response has been grouped into 4 levels as follows:

Level 1	First responding appliance
Level 2	Specialist response (limited local response RT, regional response)
Level 3	Mutual response (regional only)
Level 4	National response

Shropshire Fire and Rescue Service have the equipment to provide a level 1 response and a very limited level 2 response. This will allow the first responding appliances to assess the situation and make judgements, stabilise, cordon off and carry out surface search and rescue. Rescue Tender crews will be tasked with beginning a technical search of the area.

The pre-determined attendance for an incident involving a collapsed structure with persons reported missing will be as follows:

2 x fire appliances  
Rescue Pump (WL)  
Rescue Tender with USAR equipment  
Level 2 Incident Command  
1 x USAR trained officer/Safety Officer

It is extremely important that the USAR trained officer makes an assessment on resources that may be required as soon as possible as it could take as long as 2 hours for the regional response to attend

## **Operational procedures**

Internationally USAR incidents are usually divided into 6 stages of rescue. With the resources and crews that we have available in Shropshire we are only able to operate safely and effectively in the first 3 stages, although there are elements of stage 4 that we can start putting in place if oncoming USAR teams are not yet in attendance, for example: Identify survivable locations by using the LD3 Delsar Life Detector and the Snake-eye Search Cam all of which are carried on the Rescue Tender.

### **Stage 1 – Reconnaissance and survey (SFRS crews)**

In order to start stabilising an incident crews must gather as much information as possible. Safety of crews is paramount so no crew members are to be committed onto the scene of operations until the following information has been ascertained.

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Information gathering:      Number of persons missing  
   Probable locations  
   Structural stability  
   Cause of collapse  
   Additional hazards

Resource Management:      Make up, informative messages

### **Stage 2 – Elimination of utilities (SFRS crews)**

This is an important task as it will help stabilise the environment that both the casualties and rescue workers will be operating in. As soon as possible the following utilities must be isolated

Water  
Gas  
Electricity  
LPG  
Oil

In order to limit the environmental impact control measures must be taken as soon as possible to contain any firefighting run off or hazardous materials.

Incident Commanders must obtain all relevant site plans and gain as much knowledge as possible from on site staff.

### **Stage 3 – Primary surface search and rescue (SFRS crews)**

Rescue crews are to be charged with carrying out initial search and rescue on the surface only and should be done in line with the following:

- Clear the site of visible victims,
- Set up a casualty handling area, liaise with Police and Ambulance
- Remove **lightly** trapped victims
- Appoint a Victim Location Officer (VLO)
- Prepare for a prolonged search, resources required, crew welfare, reliefs
- Place rescuers in hail and listen locations
- Establish location of trapped victims and mark areas

### **Stage 4 – Exploration of voids and spaces (USAR/Shropshire specialist crews)**

Due to the limited availability of equipment and sufficiently trained staff, Shropshire Fire and Rescue Service will have limited impact on stage 4. Although we do have listening equipment we do not have any equipment that will allow us to enter and explore into voids and spaces. Our role under stage 4 starts and finishes with locating victims underground using our equipment and listening for indications of persons still alive. Stage 4 is the point at which the designated regional and or national team will take over responsibility for rescue operations, although the SFRS officer in charge will maintain overall control of operations.

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It is important to remember that by our initial actions in information gathering and carrying out surface searches we will have already saved valuable time.

Stage 4 responsibilities: USAR teams/Shropshire teams:

- Identify survivable locations
- Silence every hour
- Use dogs, listening devices and search cameras
- Break entry into voids and spaces

### **Stage 5 – Access by selected debris removal (USAR Teams)**

Stage 5 involves USAR teams only carrying out the following:

- Deeper exploration of voids and spaces requiring careful assessment of stability of rubble pile
- Concentrate on and prioritise areas with a high probability of success first
- Tunnelling and shoring
- Regularly test air quality
- Maintain egress
- Consider roped access

### **Stage 6 – Terminate by general debris removal (Single USAR team)**

This is the final stage and involves body recovery making use of heavy lifting equipment as carried on Module 3 and 4

Tasks include:

- Systematically remove debris to gain access to remaining victims
- Only one team operating safety is paramount
- Heavy lift equipment, vertical removal only
- Re-assess stability regularly
- Substantial shoring to maintain stability
- Body recovery

## **Significant hazards and risks**

Operating in an incident where a structure is unstable or has already collapsed is an extremely dangerous environment. Crews should only be committed into the risk area once all control measures have been put in place and only if there is a need to do so.

Dynamic risk assessment must take place, and the Incident Commander must liaise with the Police to have the area cordoned off to stop members of the public becoming endangered. If needs be allocate somebody to take up the role of Cordon Officer (see Standard Operating Procedures (SOP's) Fire Ground Roles)

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Only those persons who have the correct level of personal protective equipment and who are adequately trained are permitted to enter the risk area.

Crews operating within the risk area must do so in teams consisting of a minimum of 2. They must have radio communications and check in with the command vehicle or incident commander on a regular basis.

Always enter the risk area via the cordon control so that all crew members can be accounted for.

Services must be isolated as soon as possible to reduce the chance of electrocution, explosion from flammable gases and flooding

Further guidance reference risk assessment should be taken from the Guide to Operational Risk Assessment manual

## **Crew Welfare**

Incidents involving structural collapse with persons reported have the potential to be protracted, often requiring large amounts of resources in terms of crews and equipment. Crews should take every opportunity to rest when not active, and should always keep themselves adequately hydrated. Crews should be relieved in line with our current policy. Fire ground feeding/welfare should be made available as soon as possible in line with our current policy.

## **Training**

All crews should make themselves familiar with the content of this Brigade Order and the associated points of reference.

The Rescue Tender based at Wellington has specific equipment on it for use in the initial stages of USAR. It is important that crews, particularly Officers in charge of appliances, make themselves familiar with the equipment and the procedures associated with its use.

In order to be effective at such incidents, Incident Commanders must be aware of the 6 stages and the mobilisation levels for USAR incidents.

A training rig is available to be used under supervision from the training staff at Telford Central. This facility will give crews and the Incident Commander an opportunity to use and see the equipment available on the Rescue Tender. In addition to this SFRS has an agreement with a local company who have set up a rig for Wellington crews to carry out joint training exercises with Hereford and Worcester Fire and Rescue Service USAR Teams

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## Points of Reference

Specific Incident Procedures	USAR
Standard Operating Procedures	Cordons Officer
Guide to Operational Risk Assessment	Section 2.6 Rescues from collapse structure
Fire Service Manual Volume 3	Basic Principles of Building Construction
Brigade Orders Operations 7 part4	Section 1 Fire Ground Refreshments

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### **USAR Module 1 Tech search & initial response**

An initial response vehicle for the first few hours of a structural collapse incident.



**Equipment includes:**

- Search cameras
- Seismic & acoustic listening devices
- Concrete cutting & drilling
- Electricity generation
- Lighting
- Shoring equipment.

### **USAR Module 2 Heavy cutting and lifting**

Equipped with a range of heavy cutting and lifting equipment for dealing with major transportation related incidents



**Equipment includes:**

- Disc cutters and hot cutting equipment
- Heavy lift airbags
- Confined space equipment
- Rope access equipment
- Chainsaw

### **USAR Module 3 Additional support**

Equipped with additional equipment to support Module 1



**Equipment includes:**

- Heavy breaching and breaking
- Advanced timber cutting and shoring
- Heavy lifting and moving
- Access platforms
- Lighting

### **USAR Module 4 Logistic support and MPV**

Capability to lift and remove quantities of rubble or deliver equipment to the scene of operations



**Equipment includes:**

- Tipper tailgate
- 4x4 Multi purpose vehicle
- Bucket or fork attachments
- External hydraulic hook up
- Air shelter
- Generator and lighting

### **USAR Module 5 timber shoring**

A frame module with large quantities of timber for large scale shoring operations



**Equipment includes:**

- 9 tonnes of timber**
- Wedges and shims**
- 18mm marine ply sheets**
- 4x4, 4x2, 8x6 timber**
- Timber cut station**