

## Crewe Fire Station Rebuilding Project Summary of Feasibility Reports and Options

### Introduction and Options Considered:

1. The existing building is known to be in very poor condition, requiring extensive refurbishment and remodelling. The structural layout of the building is such that it appears to be a very rigid reinforced in situ concrete frame with lateral restraint provided by large spine walls. Alterations to this structure will, if feasible, be expensive. It is felt at this point that they will not be possible.
2. The slender nature of some of the columns particularly in the appliance bay, combined with knowledge of the build date suggest that HAC (High Alumina Cement) may have been used in the construction of the building. This will mean that the existing frame will have a shortened lifespan and may not be compliant with today's structural design criteria. HAC is no longer used having been found to decay considerably faster than traditional concrete.
3. The existing Fire Station is supplemented by a 1990's built "Community Bungalow" which is of domestic style construction; load bearing masonry with roof trusses and domestic standard services installations.
4. An initial site appraisal identified three options for consideration in an initial feasibility report. From this report it subsequently became clear that the cost of a temporary fire station for two fire appliances and two wholetime fire crews would be prohibitive and a further Option (4) was identified to rebuild the station without the need for a temporary fire station. Whilst this option separates the construction site and operational response, as with any "shared site" there is a considerable risk that the construction operations could cause operational disruption and create dust and noise issues in the existing station whilst the works are undertaken.
5. A consultation exercise with the Operational Crews undertaken by the Station Manager, resulted in a suggestion from Blue Watch of an alternative Option 5. This option would entail an initial build of a new Appliance Bay to the south of the existing station, the use of the community bungalow as part of a temporary fire station, followed by the demolition and rebuilding of the remainder of the station, whilst using the new Appliance Bay in lieu of a temporary appliance bay.
6. An initial review has been undertaken of the option, to determine its potential viability. This identified four issues that led to it not being taken further:
  - a new appliance bay will not fit to the south of the existing station, due to the presence of a high voltage cable in the vicinity and the easement that protects it.
  - building an appliance bay as a stand alone structure will require extensive temporary works.
  - this option does not provide the programme shortening that delivers approximately £400k of cost benefit in Option 4.
  - the proposed temporary accommodation is inadequate for the operational needs (as briefed)
7. Further investigations have taken place to determine if alternative temporary facilities are available within a one mile radius of Crewe Fire Station for use as a temporary off site facility for the duration of the build. Suitable buildings will require significant fit out works to allow

use as a fire station. This has been considered in Options 1A, 2A and 6. Further investigations this week have identified a number of options which may be available. Obviously, these will all require the Service to enter into arrangements with a third party. However it is felt that overall this will have considerable benefit to the project as it will remove the risks associated with maintaining operational response in close proximity to a confined construction site.

8. Whilst examining the off site options a seventh option to undertake partial demolition, build new and construct a partial temporary fire station on site has been identified and considered further.
9. In summary the multiple options considered are:
  - 1 Refurbish and extend the existing station, (requires a temporary fire station)
  - 1A As Option 1, with off site temporary accommodation
  - 2 Complete Replacement, (requires a temporary fire station)
  - 2A As Option 2, with off site temporary accommodation
  - 3 Partial replacement, retain community bungalow, (requires part of a temporary fire station).
  - 4 Complete Replacement, community bungalow used for Contractors Accommodation (no temporary fire station).
  - 5 Phased Build suggested by crews. – Not considered further.
  - 6 As Option 3, with off site temporary accommodation [essentially 3A]
  - 7 Partial demolition, temporary appliance bay only, retain community bungalow

**Budget Comparison:**

- 10 In summary the costs for the various options are as follows:

Option 1:	Refurbishment (on site temporary station):	£ 8.10m
Option 1A:	Refurbishment (off site temporary station):	£ 7.35m
Option 2:	Complete Replacement (on site temp Station):	£ 7.70m
Option 2A:	Complete Replacement (off site temp Station):	£ 7.05m
Option 3:	Partial Replacement – Retain Bungalow only with on site temporary Station:	£ 7.70m
Option 4:	Complete Replacement with no Temporary Station:	£ 6.58m
Option 6:	Partial Replacement – Retain Bungalow with off site temporary station	£ 6.94m

Option 7: Phased Build, temporary appliance bay on site. Retain Bungalow £ 6.93m

- 11 The most economical option, is Option 4 at £ 6.58m. This is broadly comparable with the costs for Chester (after adjustment for inflation and project differences).
- 12 Options 6 and 7 are the next most economical at £6.94m and £6.93m respectively. Both these options retain the community bungalow. However Option 6 requires relocation of the operational response off site for the duration of the build and Option 7 requires a partial temporary fire station on site.
- 13 Option 7 involves both a construction site and operational response working in closer proximity for longer than Option 4, creating additional risks to both the operational crews and construction workers and potentially creating turnout delays. In addition, it hasn't delivered the anticipated cost benefits over Option 6. Consequently, it would be preferable to either construct Option 6 with the operational response off site or Option 4 with the operational crews retained on site. It is, therefore our view that Option 7 can be discounted.
- 14 Option 6 has considerable merit in that for an additional £ 360k the operational response can be moved off site, thus separating operations and construction during the build phase and making the construction site less constrained. Both of these benefits will lead to a reduction in the risk of accidents to both construction and operational staff.
- 15 Should Option 6 be chosen then there is also a possibility of exploring further options for the site layout as the constraint of maintaining operational response will have been removed. It is suggested that agreeing a final site layout is best left until the next stage design team is appointed.

**Risk Comparison:**

- 16 It is worth noting that Option 1 whilst containing a larger contingency in the budget than the other options also comes with a considerably increased risk profile. This is associated with the unknowns of working with an existing building, which will only identify themselves as work commences to strip the existing building.
- 17 The options which require off site temporary accommodation reduce the risk profiles for the works considerably as they separate the emergency operational response and site construction activities further than would be possible with both being retained on site. However, they do have risks of their own as the fitting out and hiring of a suitable industrial premise brings additional cost and project uncertainties.
- 18 Overall the Project Team believe that the risks to the safety of both site operatives, fire service staff and operational response are lowest with the implementation of off site temporary accommodation.

**Programme Comparison:**

- 19 A summary of the overall build periods is as follows, each will be preceded by a 53 week pre construction phase, which for illustration purposes uses 1<sup>st</sup> January 2021 as the design commencement date.

- Option 1: Build Period: 89 weeks                      Completion Date: Sept 23
- Option 1A: Build Period: 63 weeks                      Completion Date: March 23
- Option 2: Build Period: 76 weeks                      Completion Date: June 23
- Option 2A: Build Period: 55 weeks                      Completion Date: Jan 23
- Option 3: Build Period: 85 weeks                      Completion Date: Aug 23
- Option 4: Build Period: 58 weeks                      Completion Date: Feb 23
- Option 6: Build Period: 55 weeks                      Completion Date: Jan 23
- Option 7: Build Period: 70 weeks                      Completion Date: May 23

Comparison of Operational Outcomes:

20      As part of the initial feasibility study the operational crews were asked to undertake a qualitative analysis of Options 1 – 3, to consider how they each best delivered the desired operational outcomes. In summary this identified (for detail see Page 11 of the initial feasibility report):

- Option 1:    negative feedback – no benefits
- Option 2:    positive feedback – no negatives identified
- Option 3:    both positives and negatives identified. The principle negatives being the remoteness of the accommodation to be housed in the refurbished community bungalow being “remote from the operational crews” and not “in the spirit of the inclusivity agenda”.
- Option 4 wasn’t specifically analysed but as the building is based on Option 2 it is expected similar comments will apply.
- Option 6 and 7 haven’t been specifically analysed but as the buildings in both options are based on Option 3, it is expected similar comments will apply.

Planning:

21      A pre planning enquiry was submitted to Cheshire East Council on the 12<sup>th</sup> June 2020, in respect of Options 2 and 4 only. The feedback received has been supportive of the principle of redevelopment with a specific request for a heritage survey being the only unusual requirement.

22      The use of a nearby industrial unit as a temporary fire station will require an additional planning application to be made for a temporary use. This clearly creates a potential risk of refusal, however it is likely that a temporary change of use to facilitate a redevelopment elsewhere would meet with approval. This hasn’t, however, yet been tested with Cheshire East Council.

Zero Carbon Comparisons:

- 23 The expectation of new buildings going forward is that they achieve a BREEAM Excellent Standard (or equivalent), with a “Zero Carbon” standard in respect of regulated energy.
- 24 Whilst these standards have not yet been enshrined in policy documents, it does appear in draft planning policy and building regulation documents and is expected to become statutory in the near future, probably prior to commencement of this project on site.
- 25 It is therefore prudent that these standards are applied to future new buildings. Whilst these standards will not be applied to existing buildings imminently other legislation is proposed in the medium term that will introduce a carbon tax on emissions from property to encourage retrofitting of measures to achieve zero carbon on existing property.
- 26 All of the new build elements of the options considered will meet these standards of BREEAM Excellent and Zero Carbon – Regulated Energy. In the case of Option 1, 1A and the refurbished elements of Options 3, and 6 and 7 this will not be the case.
- 27 The BREEAM Assessment for refurbishments is a completely different assessment than for a new build and whilst we can achieve a BREEAM Excellent (Refurbishment) for Option 1 at present, it is unlikely that we will achieve this rating when this assessment is upgraded, which is expected to occur later this year, early next year.
- 28 Whilst all of the refurbished elements in each of the options will demonstrate a considerable decrease in energy consumption achieving “Zero Carbon” is not possible within the budgets identified above. This is largely due to the inability to improve the existing fabric sufficiently to achieve the heat loss calculations required.

Retention of Community Bungalow:

- 29 Options 3, 6 and 7 include the retention of the existing bungalow.
- 30 There is a view that a “new building” such as this should be retained until it reaches then end of its design life (circa 60 years).
- 31 In considering the options, a condition assessment of the bungalow has been undertaken. Whilst items such as the external walls are in good condition and would last a further 30 years without intervention, other building systems such as boilers, wiring, windows and the like which normally have a life span of 25 – 30 years are in fact nearing the end of their lives and the building will shortly require a major “half life” refurbishment at considerable expense.
- 32 The cost of undertaking this has been identified as being £114,850 and this has been incorporated into the costing of each option, where relevant.
- 33 Undertaking the refurbishment referred to above will improve the carbon consumption credentials of the building and with the addition of PV Panels to the roof (not costed pending assessment of the roof structure) it could be further improved. However, put simply there isn’t enough roof to provide the PV area necessary to offset the carbon consumption of the building.

- 34 As the building will be heavily stripped as part of the refurbishment, it is thought by the professional design team that demolishing the building using the crushed masonry in the formation of the training yard, would be as “green” a solution as refurbishment.
- 35 This has the benefits of:
- Saving refurbishment cost
  - Saving a potential long term “carbon tax” liability
  - Reducing operational energy consumption
  - Increasing the overall usability of the whole site. (Option 4 cannot work without it’s demolition).

Temporary Fire Station:

- 36 In order to maintain the operational response during the build phase most of the options identified require the provision of temporary facilities. These temporary facilities take two approaches:
- a. Options 1, 2 and 3 require the full provision of a temporary fire station on site, in facilities similar to those being used currently at Chester Fire Station.
  - b. Options 1A, 2A and 6 require the hiring of a nearby industrial unit for use as a temporary fire station. A site search undertaken in September 2020, has identified at that time availability of one unit which would be suitable. (It was the only unit available at that time).
- 37 Whilst this facility will be suitable, it will require compromise to accommodate a temporary fire station in it. This may include:
- Two Appliances parked one behind the other, not side by side, sharing a single vehicle exit.
  - Not all the operational facilities associated with a fire station can be accommodated due to space requirements. There may for example, be insufficient room to provide a Gym. Also the provision of a BA Compressor and cylinder charging, may be difficult and consequently have to be at a nearby station.
- 38 As an industrial unit is essentially a large warehouse (open space), it will require considerable fit out works to provide the necessary facilities, which will require removal on completion. It has been assumed that this will be provided through the erection of portable buildings internally to the warehouse. (This will also make it easier to heat etc).
- 39 Further discussions will need to take place with the operational staff when the premises to be occupied temporarily are finalised, to arrive at a temporary accommodation specification that is acceptable.
- 40 Of these two options the off site option still has considerable cost of circa £360k, however this is considerably lower than the circa £1m cost of the on site option that was originally being considered.

Recommendation:

- 41 The recommendation is that Option 6 at an estimated capital cost of £6.94m and a build period of 55 weeks be pursued, with the provision of off site temporary accommodation utilising a nearby industrial premise on a short term lease.
- 42 In the event that it isn't possible to achieve a suitable off site rental solution Option 4 remains as a potential second solution which could be pursued.
- 43 Both Options are viable from a construction perspective and will result in the provision of the required facilities. However, Option 4 carries additional risks and design compromises as a result of working around the existing building.