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D. HUGHES
DEMOLITION & EXCAVATION LTD.

CASE STUDY – Keighley College

Project	Keighley College
Project Address	Cavendish Street, BD21 3DF 
Client	City of Bradford Metropolitan District Council
Principal Designer	City of Bradford Metropolitan District Council
Principal Contractor	D. Hughes Demolition & Excavation Ltd
Nature of the Project	Demolition of former Keighley College, Cavendish Street. Keighley. BD21 3DF. The works involve the demolition of the four storey former Keighley College building which fronts onto four roads.
Value	£270,680 including credits
Length of Contract	20 weeks
Start date	December 2016

Description of the works

The footprint of the site was originally built between 1860 and 1900 as a four storey masonry structure with slated pitched roofs on timber trusses and timber floors. In 1960's part of this structure was fire damaged and replaced with the reinforced concrete frame structure that is there now.

The site was in the Centre of Keighley Town Centre and was located at a busy traffic light controlled junction. The site was surrounded by shops, offices, businesses and some residential properties.



The building comprised of a Victorian masonry structure, approximately 70% and the remainder 1960's reinforced concrete frame structure.

The Victorian masonry structure was demolished first. During the demolition all material was brought to ground level in a controlled manner within the site boundary using a CAT 345 high reach hydraulic excavator.

The demolition of the reinforced concrete frame building followed on after the Victorian Structure. The structure was demolished by machine from within the site boundary. To accommodate this up to three partial road closures had to be arranged on Cavendish Street and North Street on Sundays only.

Sequence of demolition:

1. Site establishment
    - Erect signboards
    - Scaffold
    - Hoarding
    - Tree protection
2. Removal of former air raid shelters
3. Soft Strip
4. Roof slate removal
5. Bat removal ((by Natural England)
6. Demolition
    - Demolition of the Victorian masonry structure on North Street
    - Demolition of the reinforced concrete frame building on North Street and Cavendish Street
    - Demolition of the Victorian masonry structure on Lord Street.
7. Ground floor slab, foundations, cellar walls, underground air raid shelters and basement removal
8. Site clearance
9. Removal of site security fencing
10. Site finish

Demolition was executed in 3 phases

Phase 1

The first phase of the project commenced on North Street and the demolition of the old eighteenth century building.

The trees on North Street and within the car park area are designated protected trees. Tree protection fencing had to be erected and maintained throughout the duration of the works.

Scaffolding was erected to the gable end on North Street. The selected Scaffold Company produced a Method Statement, Risk Assessments and Scaffold Permits which were submitted and approved prior to the scaffold erection.



Removal of former air raid shelters

There were a number of underground air raid shelters sited at the main entrance to the building off Alice Street. As part of the works, these had to be excavated, foundations removed and then backfilled with class 2 hard-core fill.

Prior to excavating the air raid shelters they had to be surveyed and recorded by others. We facilitated this by providing a confined spaces team to assist the surveyors.

The roofing slates were removed for salvage prior to the demolition of the

buildings.

The mechanical demolition of the building commenced at the gable elevation to help to maintain the structural stability of the building whilst being demolished.

A CAT345 high reach hydraulic excavator was utilised to access the higher areas assisted by a second hydraulic excavator working at ground level.

As the demolition of the building neared the opposite gable wall the demolition of the structures were kept stepped back at an approximate 45º angle from the ground floor upwards, to help keep the structure of the building stable whilst the higher level gable wall was demolished.

Phase 2



Phase 2 comprised of the demolition of the 1960s reinforced concrete framed building which was taken down in four sections; each section approximately 20 metres in length along North Street.

The high reach excavator fitted with a hydraulic pulveriser attachment pulverized the vertical and horizontal beams in a controlled manner and in sections starting from the roof down working across the back section of the building and away from the façade. Particular care and attention was needed to ensure that the façade was not disturbed or allowed to become structurally unsafe.

To minimize the dust created during the process, the beams were pulverized at the corners to release them and then carefully lowered down to ground level where the second excavator continued to pulverize the concrete to separate the steel.



Dust monitoring was carried out during the works on a daily basis and more often if conditions dictated. Records were kept showing weather conditions, especially windy or dry days. Four dust management points external to the site were established prior to works commencing for monitoring purposes.

Demolition of the facades: To accommodate the demolition of the façade/front elevations on North Street, four partial road closures were arranged on Sundays.

Bradford MDC arranged the road closures but the DHD & E Ltd. were responsible for implementing and lifting the closures to accommodate the works

Phase 3

Phase 3 consisted of the demolition of the final section of the college along Lord Street; the old eighteenth century building.

The method to demolish the last section on Lord Street was by the same method as in Phase 1.



Nearing completion; Site level and tidy; knee rail to be installed.