FOR ENGINEERING CERTAINTY

12 Dowry Square
Hotwells • Bristol
BS8 4SH

T: 0117 929 7949
F: 0117 927 3269
E: info@kb-2.co.uk
W:www.kb-2.co.uk

Summary of Design Principles

Midsomer Norton Town Hall

Prepared By: Tim Pattinson MEng CEng MIStructE
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221142

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Appendix

1 Project Description

Midsomer Norton Town Hall is located in Midsomer Norton, Somerset. The Town Hall is having refurbishment work carried out over two phases. The Phase 1 works include; reinstating the former open plan market hall at ground floor level which involves removing an existing mezzanine floor and also alterations to the layout of the ancillary space to the rear of the building. Phase 2 works include; a four storey extension to the side of the Town Hall to house meeting rooms and office space.

2 Technical Description

KB2 have been appointed to carry out civil and structural design for the Phase 1 alterations which is the focus of the document from here on.

Existing structure

The existing building, constructed in 1860, is a four storey structure featuring two large double height spaces occupying the majority of the footprint and also features a four storey ancillary space to the rear. Ground floor level originally occupied a double storey height market hall space at the front which has had a mezzanine floor constructed in the recent past. Second floor level features a double height theatre space above the original market hall space and this links through to the ancillary space at the rear.

Reinstating the ground floor market hall

To carry out these works the existing mezzanine floor is being removed along with existing load-bearing spine walls which support the existing second floor theatre. It is reported that the original double height market space featured cast iron columns supporting a central timber spine beam. The spine beam remains in-situ and the cast iron columns were removed and replaced with load-bearing walls in an effort to strengthen the second floor structure.

Four steel beams are being introduced between the existing joists at second floor level which will have steel plates slung below the existing timber spine beam and bolted through to support the beam at approximately 3m centres. Three of these beams will be supported on steel posts and one will be supported on padstones in the existing wall. Posts are required where the existing wall features large, glazed openings along the side elevations. The posts will be supported on pad foundations. Temporary propping is to be installed to the existing timber floor structure to the theatre for the duration of the works (to be designed by contractor). Splice connections to the beams have been detailed at third points in order to assist the erection of the steel frame. The existing theatre floor above is not to be lifted/damaged.

The existing floor construction throughout is being replaced with a suspended beam and block floor with 150mm void below due to the two existing lime trees outside the front of the building. New pad and strip foundations are being introduced which have been stepped back from existing walls to avoid disturbing the existing foundations.

Ground floor openings in existing 560mm masonry wall

Approximately 3m wide, single storey openings are being formed at ground floor level in an existing 560mm wide wall which separates the market hall and ancillary spaces. The openings will be formed

with box frames formed with 152 UC steel sections. Temporary propping/needling is to be installed for the duration of the works (to be designed by contractor).

Demolition of existing barrel-arches
A 2m wide masonry barrel arch was constructed within the building at ground floor level which is reported to have once housed a 'strong room' in the building. This construction is not contributing to the overall vertical/horizontal of the building.

Re-modelling of four storey ancillary spaces
An opening at first floor level is being introduced to create a double height foyer for the existing side entrance. A new staircase is being constructed adjacent to the existing lift and the existing floor structures to be trimmed to suit. A new floor is being paced at third floor level for the proposed MVHR unit with an existing trimming being strengthened.

Drainage diversion
There are existing drainage runs under the two alleys adjacent to the town hall. The drainage run in the alley to the north of the town hall is being diverted in order to allow the placement of the new disabled ramp/fire exit. The existing drainage run in the alley to the west of the town hall is being lowered in order allow the diversion to take place.

3 Loading

Design Loadpaths

Vertical Loads
The suspended floor and roof structures are supported on solid masonry walls and steel framing. The masonry walls are supported on strip foundations and the steel posts are supported on concrete pad foundations.

Horizontal Loads & Overall Stability
Horizontal wind loading is resisted by masonry shear walls in orthogonal directions.

Robustness & Disproportionate Collapse
The existing building is used by the public and is four storeys high which is classed as a Class 2B structure. The alterations include internal re-modelling only and there will be no change in use of the building. The existing structure consists of suspended timber floors supported on masonry walls. Additional steel framing is being added to the building as part of the internal alterations which improves the strength and robustness of the existing floor structures.

Design Loads

To be assessed in accordance with: BS6399 Part 1 (1984)
Part 2 (1997)
Part 3 (1988)

Dead Loads

(See KB2 structural calculations document)

Imposed Loads

(See KB2 structural calculations document)

4 Temporary Works/Sequence

Temporary works design is the responsibility of the contractor. Existing load-bearing structures being demolished have been highlighted on KB2 drawing 108.

5 Survey and Ground Conditions

A trial pit has been carried out on site to determine the approximate depth of the existing footings and characteristics of the natural soils. The ground level around the perimeter of the building varies by 600mm and the depth of the existing footings were ~1m below ground level where the trial pit was taken. The natural soil at the base of the trial pit were stiff clays.

6 Foundations

The existing and proposed foundations are strip and pad foundations bearing into the natural stiff clays at ~1m BGL.

7 External Works

A new fire exit with disabled ramp is being constructed in the side alley. The front entrance ramp is being replaced however this item is outside of our appointment.

8 Drainage Design

The building drainage has been designed in accordance with BS EN 752 Drain and Sewer Systems Outside Buildings, Building Regulations part H and Sewers for adoption where applicable.

9 Sustainability

Re-use of the existing structure has been specified wherever possible. Steelwork has been introduced where required to ensure that the suspended floor structures achieve the design occupancy loading.

10 Fire

Fire protection of the steel and timber structure is being specified by the architect. This will be in the form of fire protection boarding with any exposed steelwork coated in intumescent paint

11 Sound Resistance / Acoustics

Sound resistance and acoustics requirements for the building are being analysed and specified by Method Consulting.

12 Movement Joints

The new ground floor slab has a movement joint at the junction between the market hall and the ancillary space to the rear to minimise concentrated thermal movement cracks occurring at this junction.

13 Concrete

To be designed in accordance with: BS8110 & BS8500.
Concrete for the new pad foundations is to be GEN3 and RC40 with A393 mesh reinforcement for the new ground floor slab and external ramp.

14 Steel

To be designed in accordance with: BS5950.
The steel is to be grade S355 and bolts are all to be grade 8.8.
All steelwork is to be fire protected in accordance with details by the architect.

15 Masonry

To be designed in accordance with: BS5628.
New blockwork is to be minimum 7N block U.N.O.
New mortar is to be matched to the existing mortar U.N.O.

16 Timber

To be designed in accordance with: BS5268
All new structural timber is to be grade C24.

Appendix A – Summary of Residual Risks

Summary of Residual Risks - Construction Stage

To be considered by the Principle Contractor when drafting detailed risk assessments and method statements for the works.

This document lists only residual risks - those which despite careful consideration could not be designed out.

All the risks are 'project specific' as a Competent Contractor is assumed to be aware of the guidance in the HSE publications "Health and Safety in Construction" and "Health and Safety in Refurbishment Involving Demolition and Structural Instability" as well as BS 6187.

REF NO.	ACTIVITY OR ELEMENT	POTENTIAL HAZARDS	REQUIREMENT FOR RAMS	INFORMATION FOR FILE
1	Alterations to existing building - Health & Safety of the site employees and passers-by.	Damage to building or injury caused by falling objects or collapse.	The contractor is to read and understand the works shown on the engineer's drawings and to ensure that the works are carried out with the necessary care required to not damage the existing building. Temporary works are to be provided.	Works to be sequenced safely and carefully controlled. Contractor to appoint a Temporary Works Co-ordinator to oversee the design, manage and supervise all temporary works.
2	Working close to a public highway / car park.	Damage or injury caused by falling objects or collapse.	Contractor to install suitable protection to separate the site from members of the public.	Site operatives to be briefed.
3	Deliveries to a confined site.	Injury or damage caused by collision with delivery vehicles.	Consider performing deliveries using smaller vehicles and all traffic movements to be adequately planed and supervised.	Site rules and method statements produced by Contractor.
4	Foundation excavations	Damage to existing building or injury	Excavations to be carefully controlled and back propped where required. All existing services to be located and area to be CAT scanned.	Obtain services drawing for site briefing.
5	Goalpost frame erection.	Injury due to falls or falling materials / collapse while installing steelwork.	Lifting and erection plan required and steelwork sub-contractor to ensure temporary stability of frame during erection.	Site rules, method statements and plan produced by Contractor.

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