



# Old Benn High Re-Development Project

September 2, 2022

## Structural Narrative

### Existing Structure:

The existing structure is a two-story building which is generally masonry and structural steel framed with a first-floor concrete slab on grade and a second-floor concrete slab on metal deck. The building as a whole has seen multiple additions throughout its lifetime and the signs of these additions are visible in the building structure and construction materials used. The building was previously used as a public high school.

The Town of Bennington phase of the project will primarily occupy the most recently renovated portion of the building. The second floor of this portion of the building was built as a vertical addition and constructed over the top of a previous single-story addition. The original roof structure from the single-story addition remains in place and is visible throughout this portion of the building.

In general, the building utilizes a combination of load bearing concrete masonry walls along with structural steel beams and columns as the gravity load resisting system. The floors and roofs are supported by steel bar joists. In general, the existing structure appears to be well suited to support the proposed use.

### Proposed Reuse:

Based on our observations of the existing roof structure, the previous use, and some limited analysis of the existing structural system; the building appears to be well suited for the proposed reuse without requiring significant upgrades or reinforcement of the existing structural system. Large scale structural modifications or reinforcement of the existing building are not expected at this time. The building appears to have adequate structural capacity to meet the load requirements of the proposed use.

The removal of an existing, interior, concrete stair on grade between the Fitness Center and the Gym is planned as part of the renovations. The stair would be replaced with a ramp to accommodate the change in floor elevation. The walls on either side of the ramp are existing concrete masonry bearing walls. At the high end of the existing stair (Fitness Center side), it is possible the existing footings are directly below the concrete slab on grade and could require underpinning prior to excavating for the proposed ramp to avoid undermining the foundations during construction. Most



**ENGINEERING**  
PLLC

likely, the underpinning could be performed using the pit method of underpinning where concrete is placed in small pits which are dug beneath the existing footings. By sequencing the excavation of the pits and placement of the concrete, the underpinning can be advanced without undermining the wall above.

New openings in existing masonry interior and exterior walls are proposed. In general, the existing wall and structure above can be supported with new structural steel lintels. Openings less than approximately 8-feet in width can typically be made by inserting structural steel angles to act as lintels within the existing CMU construction. For larger openings, a structural steel wide flange beam may be necessary to support the existing structure. Limited, temporary shoring may be required to safely support the opening until new lintels have been installed and made permanent. This shoring can typically be accomplished by placing needle beams through the existing wall and supporting them on temporary posts.

### **Proposed Exterior Renovations:**

At the exterior of the building, new walkways with ramps and canopies above are proposed. In general, the canopies are likely to be pre-manufactured canopies which can be fastened to the building using the manufacturer's typical fastening methods and supported on posts at the opposite side.

At the ramps and walkways, continuous concrete walls will be needed to accommodate the proposed grade changes. The concrete walls will be constructed of reinforced concrete and will bear on continuous strip footings which will rest on existing soils below the frost line. The concrete walls can also likely be used for the support of the canopy posts above. Given the relatively light nature of the proposed canopy structure, individual piers and spread footings at the canopy posts are not expected at this time.