



New Garrick Reuse – Preliminary Structural Demolition Narrative

May 21, 2024

The following describes Meyer Borgman Johnson’s understanding of the existing structures on this site, the general scope of work associated with shoring the New Garrick (and existing parking ramp) and demolition of the existing parking ramp. This document should be used in conjunction with two additional files: (1) structural markups and (2) photo binder, both files dated 2024-05-21. References to gridlines in the following building description are located in the structural markups file.

PRELIMINARY STRUCTURAL BUILDING DESCRIPTION:

The New Garrick building is located on the corner of 2nd Avenue West and 1st Street in Duluth, MN. For the purposes of this description, north is toward 1st Street. The building is approximately 200’ x 40’ with two stories above grade plus a below grade basement space. There is approximately half a story of grade change on the site with the north face at 1st Street level, and grade sloping downward as you progress to the south (exposing approximately half the basement along the west elevation).

The structural system for the New Garrick is multi-wythe brick exterior walls on the west, north and east sides of the building. The exterior walls support wood joists (typically spanning east-west) and iron/heavy timber girders (typically spanning north-south). The existing girders are supported on the south end by a line of columns (mixed wood, steel or possibly cast iron) adjacent to the existing parking ramp (noted as Grid 2). The second floor and roof framing both appear to match this general framing type and orientation. The spacing of columns in the east-west direction appear to coincide with partition walls between units. Dimensions tied to joist/girder spacing and spans are currently unknown (see “General MBJ Notes” in structural markups). Foundations for the existing building are also unknown, but presumably consist of stone or concrete foundation walls bearing directly on bedrock or existing soils.

The south face of the New Garrick building is the common wall between the existing building structure and existing parking ramp. Further observations will be necessary to definitively establish existing dimensions, members sizes, connections points, etc. at this critical demising wall. However, the general structural layout appears to be consistent based on our observations thus far. Please see the following for additional commentary on this relationship.

MBJ understands the original New Garrick building was constructed in 1922, and the original construction extended from 1st Street to the alleyway on the south side of the site. During

STRUCTURE THAT SHAPES

the 1950s or 1960s, a cast in place concrete parking ramp was constructed within a portion of the footprint of the existing New Garrick building. This cast in place concrete parking ramp is a five-story ramp accessed on grade from 2nd Avenue West. This structure appears to be a mild steel reinforced, one-way concrete joist and beam system. The typical concrete joist spans east-west with beams spanning north-south to cast in place concrete columns. The northern and southern bays of the parking ramp are cantilevered from the first interior column grid (relative to the parking ramp) to the edge of the structure (approximate 20' cantilever). The existing parking ramp is significantly deteriorated with many locations of exposed reinforcing steel and areas of missing concrete. It is no longer in service; it is our opinion that demolition is the only reasonable solution to reuse this site.

As noted above, the parking ramp was constructed within the existing New Garrick footprint, complicating this demolition effort. Based on a limited amount of field observation, there appears to be a consistent bearing line between the south wall of the New Garrick and north edge of the parking ramp. This is noted by MBJ as Grid 3. This grid represents the south face of the CMU wall visible on the parking ramp side. This wall appears to align with the north edge beam of the parking ramp at all levels common to the New Garrick (except for the basement, which is further discussed below).

Based on the visual observations and the description noted above, it is our understanding that the north edge of the existing parking ramp supports the south edge of the New Garrick. Grid 3 is the bearing line for the second floor and roof of the New Garrick, with the 1st Street floor extending one bay further south (Grid 4 in the structural markups). Our observations suggest the following:

- At both Grid 3 and 4, it appears the existing New Garrick building, specifically the steel/iron girders that span north-south, were shored during construction of the existing parking ramp. Following temporary shoring existing girders were cut back to their current length.
- After the cast in place parking ramp was in place, a CMU wall was installed between each level of the existing parking ramp. This created an "exterior wall" between the New Garrick and parking ramp.
- The existing steel/iron girders for the New Garrick (which were temporarily shored during construction of the ramp) were then fastened to the concrete beam or CMU wall of the ramp. We observed these connections at several locations. This connection generally consists of a seat bolted into the CMU/concrete as well as a bolted angle connection between girder web and CMU/concrete.
- The CMU bearing wall between levels of the parking ramp does not extend into the basement space of the New Garrick (except on the west end). In addition to the column line on Grid 2, a second column line (approx. 6" north of Grid 3) is present in the basement. These columns appear to be steel (possibly iron) and newer than the

rest of the New Garrick columns. These columns also feature a unique slotted cap plate, allowing the column to be installed around the existing north-south spanning girders. This suggests these columns were installed during the ramp construction and are slotted to allow columns to carry the CMU/concrete bearing line above without removing existing girders.

- When standing on the south end of the 1st Street floor structure, the head height is quite short between Grid 3 and 4. Based on a small number of locations where ceilings have been removed, the underside of the parking ramp structure is directly visible. There is no apparent weather barrier or insulation between interior space and underside of concrete structure. The north face of CMU wall was also observed at select locations at Grid 4.

The diagram below is from a study conducted by New History (provided to MBJ by Chad Ronchetti). New History's report is titled "Building Review for Reuse – New Garrick Building" and dated January 22, 2024. This figure can be found on page 7 of 17 in their full document. We are including this diagram to illustrate the relationship between New Garrick and existing parking ramp, specifically how the New Garrick floor structure "tucks" below the existing parking ramp.

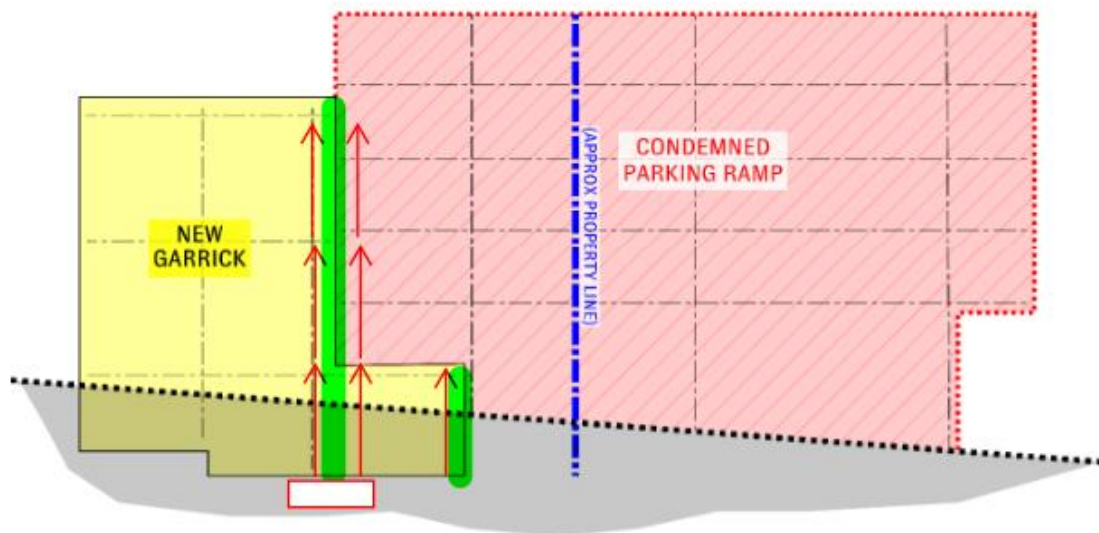


Figure 5: Diagrammatic section of New Garrick Building and parking ramp interface (grids indicate column lines and levels)

STRUCTURAL LIMITATIONS AND UNKNOWNNS:

Documentation and commentary contained in this document is based on two site visits. No existing building drawings for the New Garrick or existing parking ramp were made available

to MBJ. The first site visit was conducted on February 28, 2024. The second site visit was conducted on May 9, 2024. Both visits consisted of MBJ completing visual observations of the existing New Garrick building to assess overall building geometry and general configuration of structure.

At this time, MBJ has not specifically evaluated the existing structure (New Garrick or existing parking ramp) for compliance with code required loading. The purpose of this study is to evaluate the feasibility of shoring the existing building during demolition of the parking ramp. As such, no thorough documentation or assessment of existing structure to support code required loads has been completed.

The following is a list of areas we recommend additional evaluation and discussion prior to the execution of any shoring and demolition. This should not be considered an exhaustive list, but these are areas of interest MBJ noted while on site and during our follow up discussions:

- Removal of interior finishes: demolition of ceilings and wall finishes will allow for a thorough evaluation of existing structure. Current findings primarily based on small holes in ceilings (very few wall finishes have been removed).
- Determine frequency of connections between New Garrick and the existing parking ramp: we have highlighted our general understanding of the connection between these two structures. However, the exact quantity of connections (and whether any unique connections are present) warrants review following demolition of interior finishes.
 - It is possible additional connections are present between New Garrick and ramp, such as floor sheathing directly connected to the CMU/concrete. Must field verify all connections prior to demolition.
- Evaluation of unique framing conditions in basement space: the structure approximately 60' from west end of basement to the east is relatively consistent and matches the descriptions noted herein. However, between the west building edge and this 60' dimension, the south wall of the basement steps north. Floor framing varies in type and span. On the extreme west end of the basement, the floor appears to be cast in place concrete and a vault extends below the existing sidewalk.
- Evaluation of framing around existing stair openings: several vertical circulation elements in the New Garrick which likely feature unique framing conditions. These may not directly influence shoring or re-support details, but may need to be understood prior to reuse of the existing building.
- Possibility of unintended structural support conditions: given the cantilevered north end of the parking ramp, it is possible the connections between New Garrick girders are actually supporting the existing ramp CMU/concrete. As long as both sides of Grid 3 are shored prior to demolition, this should not be problematic.
- Existing structure east of parking ramp: upon review of photos and Google Earth imagery, the existing building directly east of the parking ramp appears to have a full

story "mechanical mezzanine". However, there are indications this space may not be original (examples: window openings on the south elevation, apparent joist line near the top of existing walls). Evaluation of this existing wall (by adjacent property owner) may be prudent.

- Use of "tuck under" space in future building: MBJ understands this basement space will be abandoned and infilled in the future use. However, this should be confirmed and accounted for accordingly during demolition.

PRELIMINARY SHORING AND DEMOLITION DESCRIPTION:

Prior to the execution of any parking ramp demolition, on the north and south side of Grid 3, full height shoring must be installed. On the north side, shoring will need to extend from basement level to underside of the New Garrick roof structure. On the south side, shoring will need to extend from basement level to the uppermost concrete parking deck. A third line of shoring will need to be installed north of Grid 4 to stabilize the south edge of the floor of the New Garrick. This is the portion of floor that "tucks" below the existing parking ramp (see New History diagram above).

In addition to designing for gravity loading, shoring contractor shall anticipate vertical diagonal bracing to resist lateral loads. This shoring design will serve as the primary lateral load resisting element on the south side of the building (as the parking ramp is presumably serving that purpose). Shoring contractor is responsible for the design of all shoring elements. This includes frequency of shoring towers, location of connection points between shoring and existing structure, whether additional shoring towers are necessary beyond those identified above, etc. If desired, MBJ can provide design values for gravity and lateral loading.

Following shoring, all connections between New Garrick and parking ramp must be severed. Contractor shall be responsible for field verifying all connection points and removing any and all connections. This may include post installed bolted connections (as noted in description), as well as embedded anchors, steel beams/columns cast into the concrete structure, and similar connectors. Once all connections have been removed, demolition of existing ramp may commence.

Following demolition (but prior to removal of shoring), the New Garrick will need to be re-supported on a new exterior wall and foundation. MBJ assumes a new CMU bearing wall will be constructed at approximately Grid 3 for the full height of New Garrick, re-supporting all existing structure to the north. This wall will require a new footing (Geotechnical study will be necessary). Building envelope will also need to be considered (Architectural input will be necessary). This scope of work is preliminary only and will be fully documented in a future phase.