July 12, 2024

Paul Ford
Deputy Director
Division of Capital Asset Management and Maintenance (DCAMM)
One Ashburton Place, 15th Floor
Boston, MA 02108

RE: Ash Street Jail
226 Ash Street
New Bedford, MA 02740
IMEG #24004006.00

Dear Paul:

At your request, IMEG performed onsite observations of several locations of the exterior walls of the Ash St. Jail in New Bedford, MA. We performed a walkthrough of the building with you, the sheriff of Bristol County, and several members of the sheriff's office and administration of the jail facility.

IMEG was engaged to review the cracking in the brick at the north and west walls of the jail due to concerns about the overall stability and safety of the structure. IMEG was also asked to provide two fixes; a temporary repair to address the short-term stability during continued use of the jail; and a longer-term permanent repair to address the deterioration and root causes.

The jail was opened in 1888 and has undergone several renovations, additions, and alterations since. The jail is constructed of brick load bearing masonry bearing walls and shallow brick arch floor slabs, with heavy timber wood trusses at the roof. The exterior load bearing wall of the structure consists of two brick walls separated by an air gap of approximately 8". Each wall is two wythes thick. The roof trusses are supported by the exterior of the two walls, while the floor framing and slabs at the second and third floors are supported by the interior of the two walls. IMEG did not do an in-depth survey of the interior or exterior of the jail complex besides the area of concern – the windows in the northwest corner of the structure – however in general the masonry and structure of the jail that was visible during the walkthrough appear to be in relatively good condition.

Observations:

The north and west walls of the jail consist of brick masonry walls with tall banks of windows. These windows are grouped together in groups of two or three, with a narrow brick pier in between, supporting a stone arch lintel at the head of the window. On these piers in between the windows, large cracks have appeared where the brick is appearing to break away from the rest of the structure. It is unknown if the piers are solid masonry or constructed similar to the walls. These cracks are limited to the piers and to the sides of the walls. There is no major cracking in the brick away from these piers. The brick on the interior of the structure in between the windows is in good condition, therefore it is IMEG's belief that the cracking is limited to the outer few wythes of the exterior wall, separated from the interior structural wall with the 8"cavity (see Figure 5). The steel bars covering the windows are attached to the walls by the embedment of the flat horizontal bars in between courses of brick. This steel appears to have been painted over the years but shows signs of corrosion, including corrosion that has been painted over. It is IMEG's opinion that these bars are a cause of the cracking in the brick: as the steel corrodes, it expands and pushes the brick apart. Water is then able to penetrate the cracks and can also be the cause of them expanding from the freeze/thaw cycle.

Figure 1. Cracking in piers on north side of structure.

Figure 2. Cracking in piers on north-west facade of structure.

Figure 3. Cracking in piers of northwest facade. Note that walls adjacent to windows without piers do not appear cracked.

Figure 4. Detail of embedded bars into side of pier at window. Note evidence of corrosion and cracking propagating from embedded steel.

Figure 5. Top of exterior wall at attic level; note two walls separated by air cavity.

Figure 6. Inside of exterior wall, looking through cavity; inside wall is to the left.

It is IMEG's opinion that, since the cracking is limited to the exterior portion of the piers between the windows and that the remaining walls on each side of the windows appear to be in good condition, that the jail is not in imminent danger and is not a danger to the current and continued occupancy of the structure. However, prior to the next freeze-thaw cycle (in the fall-winter months) a temporary fix should be performed to prevent masonry falling from the face of the building and to stabilize the structure until a more permanent fix can be performed. The proposed temporary and permanent fixes are detailed below.

Recommendations:

The cracked brick is not in imminent danger of collapsing, however, without remediation measures the cracking will continue to increase and brick can start to fall. As such, IMEG has prepared two solutions for stabilizing and repairing the brick.

1) Temporary (short-term) fix (within six months)

The short-term fix focuses on stabilizing the brick and preventing additional cracking and movement. In addition, this short term fix will help to protect building occupants and passersby from falling masonry in the event any detaches from the structure. This fix does not address the root cause of the cracking.

a) Install netting around north and west walls of this portion of the façade to prevent loose masonry from falling on passerby while steps below are in preparation.
b) Install Simpson Heli-Tie helical anchors in cracked portion of piers. At a minimum, anchors are to be installed above and below where steel bars are embedded into the masonry; and additional anchors are to be installed in between so that the spacing of the anchors does not exceed 8". Anchors should avoid the steel bars. The anchor length should be long enough to penetrate into the middle of the interior wythe of wall.
c) Pack cracks with mortar and/or grout to prevent additional moisture penetration into the crack and additional freeze/thaw cracking.

2) Permanent (long-term) fix (within 3 to 5 years)

The long-term fix addresses the root causes of the cracking in addition to providing an aesthetic fix to the outside of the structure; however, this fix will affect the occupancy and usage of the jail while construction is being performed.

a) Install shoring to support the second, third, and roof level framing during construction.
b) Remove cracked brick in piers until sound brick is left and steel bar grates in front of windows.
c) Clean bar grates of corrosion and either:
    i) Hot dip galvanize the steel;
    ii) Repaint with corrosion inhibiting, galvanizing, or epoxy paint
d) Reconstruct brick using galvanized brick ties to join brick back to sound brick at the pier toothing in the new brick with the existing until tied together.

These repairs can be staggered in time, with more deteriorated areas having a higher priority of repairs than other areas that are less deteriorated. Please see attached plan (Appendix A) showing areas of remediation and priorities and suggested time frames.

Cost Estimate:

For the short-term repairs, IMEG estimates a cost of approximately $25 per anchor. This price includes the cost of the anchor and the labor to install it; however, it does not include mobilization costs or costs to erect scaffolding, etc. to access the work areas. Those costs are highly dependent on the contractor and will vary based on contractor availability, experience, and scheduling considerations.

For the long-term repairs, IMEG estimates a cost of approximately $33,000 to $38,000 per pier that is to be replaced. This pricing does not include the following:

- Existing windows, bars and grating removal / cleaning
- Existing window screen removal
- Façade shoring and structural shoring
- Brick arch work
- Interior/finish work
- Sill and lintel replacements

Please see attached Appendix B for a rough estimate of quantities of anchors and masonry repair and associated costs for each of the areas of remediation and time frames.

Conclusion:

In IMEG's opinion the cracking of the brick piers does not pose an immediate safety issue, however without repairs the cracking will continue to worsen and may develop into a more serious structural issue. It is our recommendation that temporary repair measures be performed prior to the winter months, and that within a few years, the permanent repair is undertaken.

Please let us know if you have any questions or would like to discuss the next steps.

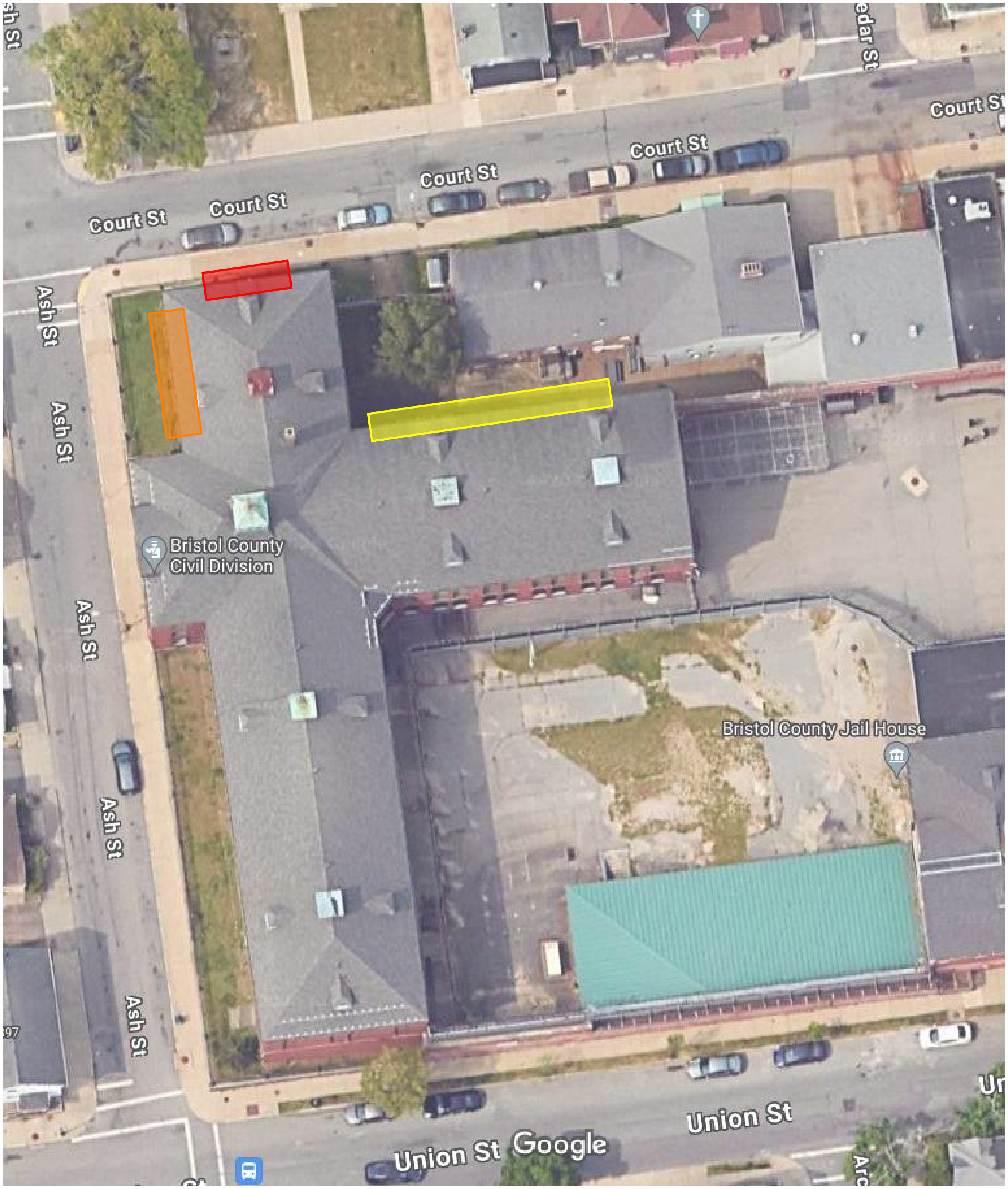
Sincerely,

Alex Lewis, PE
Senior Engineer
alex.r.lewis@imegcorp.com

ARL/vaa

cc: Lea Cosenza – IMEG; Joel Goodmonson – IMEG

APPENDIX A



KEY:

PRIORITY A	SHORT-TERM FIX:	IMMEDIATE
	LONG-TERM FIX:	WITHIN 3-5 YEARS
PRIORITY B	SHORT-TERM FIX:	WITHIN 6 MONTHS
	LONG-TERM FIX:	WITHIN 5-7 YEARS
PRIORITY C	SHORT-TERM FIX :	WITHIN 1 YEAR
	LONG-TERM FIX:	WITHIN 7-10 YEARS

PRIORITY A - NORTH FACADE

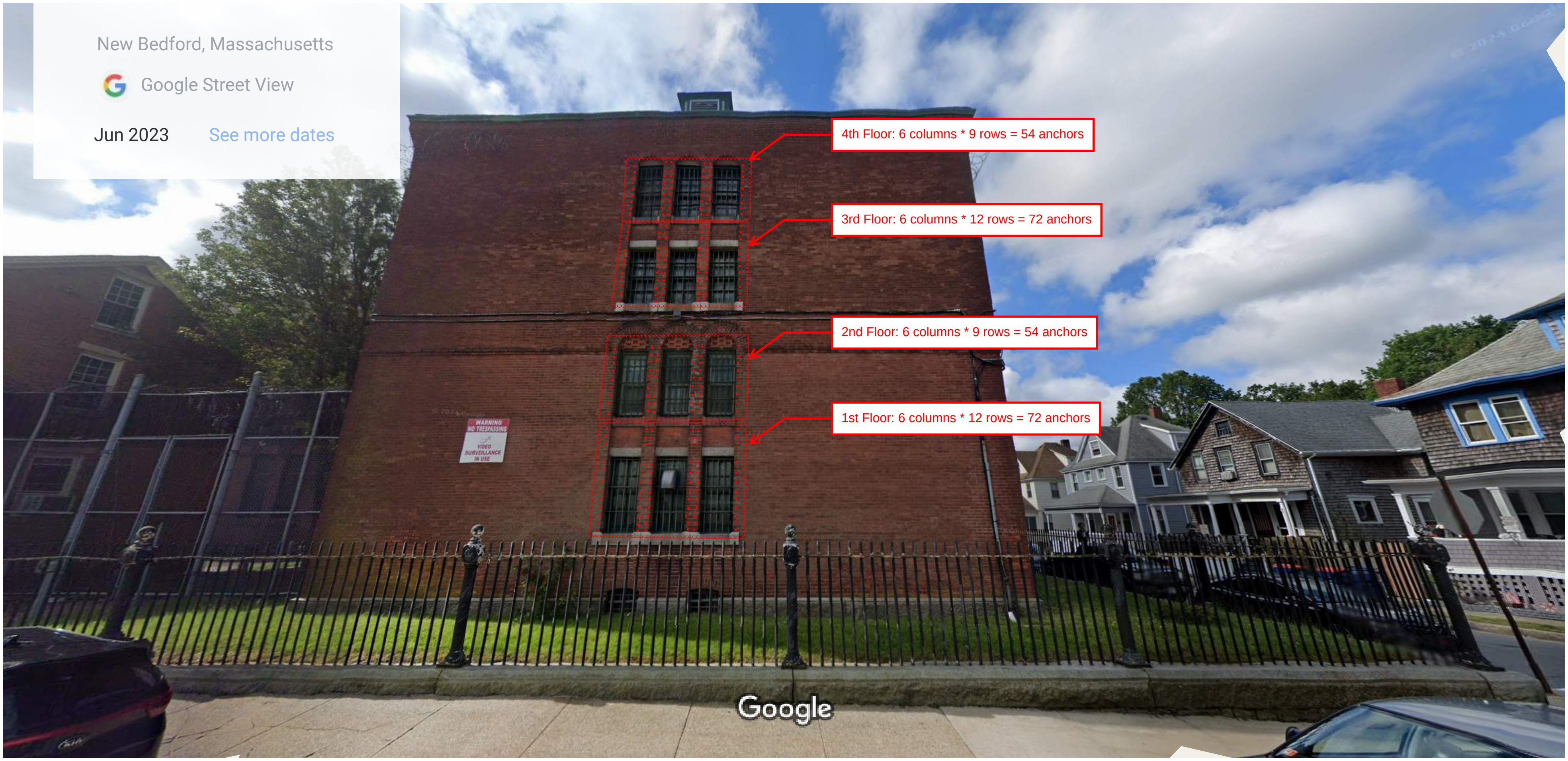
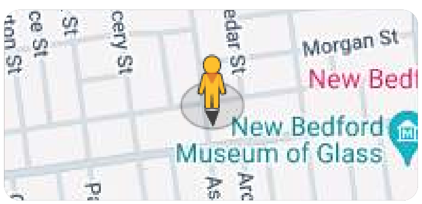
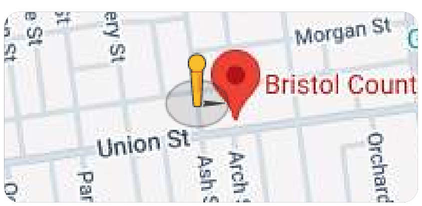


Image capture: Jun 2023 © 2024 Google



PRIORITY B - WEST FACADE

Image capture: Jun 2023 © 2024 Google



PRIORITY C - COURTYARD FACADE

APPENDIX B

SHORT TERM REPAIRS - COST ESTIMATE

UNIT COST = $ 25.00 PER ANCHOR - includes anchor plus installation labor
does not include mobilization and scaffolding costs

	PRIORITY A		PRIORITY B		PRIORITY C		TOTAL	
	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST		
FOURTH FLOOR								
COLUMNS	6		10		12			
ROWS	9		10		9			
TOTAL	54	$ 1,350.00	100	$ 2,500.00	108	$ 2,700.00		
THIRD FLOOR								
COLUMNS	6		10		12			
ROWS	12		8		9			
TOTAL	72	$ 1,800.00	80	$ 2,000.00	108	$ 2,700.00		
SECOND FLOOR								
COLUMNS	6		10		12			
ROWS	9		9		6			
TOTAL	54	$ 1,350.00	90	$ 2,250.00	72	$ 1,800.00		
FIRST FLOOR								
COLUMNS	6		0		12			
ROWS	12		0		7			
TOTAL	72	$ 1,800.00	0	$ -	84	$ 2,100.00		
TOTAL ALL FLOORS	**252**	**$ 6,300.00**	**270**	**$ 6,750.00**	**372**	**$ 9,300.00**	**894**	**$ 22,350.00**

LONG TERM REPAIRS - COST ESTIMATE

UNIT COST = $ 33,000.00 PER COLUMN

	PRIORITY A		PRIORITY B		PRIORITY C		TOTAL	
	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST		
FOURTH FLOOR								
COLUMNS	6	$ 198,000.00	10	$ 330,000.00	12	$ 396,000.00		
THIRD FLOOR								
COLUMNS	6	$ 198,000.00	10	$ 330,000.00	12	$ 396,000.00		
SECOND FLOOR								
COLUMNS	6	$ 198,000.00	10	$ 330,000.00	12	$ 396,000.00		
FIRST FLOOR								
COLUMNS	6	$ 198,000.00	0	$ -	12	$ 396,000.00		
TOTAL ALL FLOORS	**24**	**$ 792,000.00**	**30**	**$ 990,000.00**	**48**	**$ 1,584,000.00**	**102**	**$ 3,366,000.00**

UNIT COST = $ 38,000.00 PER COLUMN

	PRIORITY A		PRIORITY B		PRIORITY C		TOTAL	
	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST		
FOURTH FLOOR								
COLUMNS	6	$ 228,000.00	10	$ 380,000.00	12	$ 456,000.00		
THIRD FLOOR								
COLUMNS	6	$ 228,000.00	10	$ 380,000.00	12	$ 456,000.00		
SECOND FLOOR								
COLUMNS	6	$ 228,000.00	10	$ 380,000.00	12	$ 456,000.00		
FIRST FLOOR								
COLUMNS	6	$ 228,000.00	0	$ -	12	$ 456,000.00		
TOTAL ALL FLOORS	**24**	**$ 912,000.00**	**30**	**$ 1,140,000.00**	**48**	**$ 1,824,000.00**	**102**	**$ 3,876,000.00**