

May 25, 2017

Ringgold School District
400 Main Street
New Eagle, PA 15067

ATTENTION: Mr. Randall Skrinjorich
Director of Operations and Financial Services

SUBJECT: Structural Monitoring Letter #9
Ringgold Middle School
6023 State Route 88
Finleyville, PA 15332
WBCM Project No.: 2013.0546.000.0313

Dear Mr. Skrinjorich:

This letter is in regard to the above referenced project and, in particular, to the ninth monitoring site visit of this building via our latest agreement. On May 16, 2017, WBCM visited the school to monitor the monitoring locations that were established during the April 2009 condition assessment review, additional monitoring points established in the four (4) monitoring site visits during the two (2) years that followed, and the additional monitoring points established during the June 27, 2011 through July 1, 2011 site visits. The photo numbers and/or monitoring points referred to in this letter refer to the photos and/or monitoring points noted in our July 15, 2011 "Structural Condition Assessment/Evaluation Report".

The restoration work done during the summer of 2009 addressed several structural and exterior envelope items. The structural items addressed were the re-building of a new reinforced block bearing wall between the cafeteria and the kitchen; tying masonry walls together in the gymnasium and kitchen storage area; welding various roof joists to supporting steel; tying together the kitchen, cafeteria, and music roof area roof joists to the load bearing masonry walls; tying together the stair roofs to the stair masonry walls; reinforcing various stair roof joists, reinforcing various columns, and performing concrete grade beam restoration/rock removal in the vicinity of 1st floor joists that were accessible in various crawl space locations. In addition, several interior masonry joints were re-pointed (such as the load bearing masonry wall in the auditorium stage area). The exterior envelope items included re-pointing masonry joints and re-caulking masonry walls/precast exposed aggregate concrete panels along with the replacement of several exterior concrete slabs-on-grade.

During the fall of 2011, additional restoration work was done to address several structural items. The items addressed were the addition of stair wall bracing, the welding of roof joists to supporting roof beams, the reattachment of roof joist bridging, the addition of wall support at gymnasium, and the rebuilding of a cafeteria floor joist bearing support located within the crawl space.

During the summer of 2012, additional restoration work was done to address several structural items. The items addressed were reinforcing and/or bracing several 1st to 2nd floor columns.

During the summer of 2014, additional restoration work was done in the cafeteria. This work included removal of portions of the existing concrete floor and part of an existing grade beam. The work effort, which was limited to the floor area approximated between column lines 1-2 and B-D, was required due to the significant vertical upward movement of the structural floor system above the existing crawl space as well as the grade beam along column line C and approximately between column lines 1-2 that had significant cracks.

The measurements taken during this monitoring site visit indicate that between November 2016 and May 2017 the building is still moving. During this six (6) month time frame, the majority of the measurements taken indicate either no movement or movements of 1/16". One floor measurement in Corridor "B" and two floor measurements in the Cafeteria indicated movements of approximately 1/8".

The areas showing movement are, for the most part, the same areas of the building previously reported as moving. This report will be broken into three (3) areas of observations. Those areas are those noted and shown in the various photos identified as being monitored in the July 15, 2011 report; column plumbness for those columns identified on drawing CAR-1 of the July 15, 2011 report; and floor elevations for those areas also identified on drawing CAR-1. While WBCM has continued to monitor this building via the monitoring points noted in the July 15, 2011 report, measurement notations on various wall, column, and ceiling areas are also noted. The intent of displaying these measurements is so the school district could self-monitor if desired. The July 15, 2011 report has photos and locations of those areas where measurements could be reviewed. It should be noted that several of the monitoring notations either continue or are either being painted over or washed off. While these various points are being reset to represent their previous locations/notations, it is preferable if these points would be left alone.

It should also be noted that the Ringgold Maintenance Department (RMD) established several years ago (prior to February 2009), various monitoring points in five (5) areas. Those areas being the cafeteria, the kitchen, room E-16, the intersection of corridor "A" and "C", and the intersection of corridor "D" and "E". It is my understanding that the purpose of establishing these points was to address concerns that the school is continually moving. As part of our monitoring, these points are also being monitored.

NEW OBSERVATIONS:

During our November 2016 site visit, while reviewing the monitoring point (P #336) on the wall in the girl's restroom (432) near the intersection of Corridors "D" & "E", we observed the vertical mortar joint separated from the surrounding blocks and falling apart. We also observed the foam backer rod behind the mortar joint to be exposed where the joint is void of mortar. In our Structural Monitoring Letter #8 from our November 2016 site visit, WBCM recommended repairing the damaged mortar joint by removing the damaged mortar and installing new mortar in the vertical joint.

RMD repaired the mortar joint at this location between our November 2016 and May 2017 site visits. During our May 2017 site visit, the new mortar in the vertical joint had some cracking. WBCM will re-

establish the monitoring point (P #336) at this location during our November 2017 site visit, and continue to make observations at the vertical mortar joint.

MONITORING PHOTOS:

The monitoring points shown in the various photos indicated that there is some movement occurring in some areas. However, the majority of these monitoring points indicated no additional movement and in those areas that did indicate additional movement; the movement was 1/16" or less. In the monitoring time frame from November 2016 and May 2017, the aggregate movement of various points has not been more than (+/-) 1/16".

Monitoring Points Established during November 2015 Site Visit:

Monitoring Point (P #344-R) in Room E-20:

Since our November 2015 site visit, no change has occurred at this monitoring point.

Monitoring Point (P #422) in Corridor "G" (2nd Floor):

Since our November 2015 site visit, no change has occurred at this monitoring point.

COLUMN PLUMBNESS:

There are seven (7) columns that have been monitored since November 2009. Those columns are three (3) in corridor "D" that are identified as DC.1, DC.2, and DC.3; two (2) in corridor "C" that are identified as CC.1 and CC.2; and two (2) in corridor "B" identified as BC.1 and BC.2. In November 2010, two (2) additional columns were added to those being monitored. They are in room A-19 (identified as A19.1) and room A-18 (identified as A18.1). In May 2011, another column in corridor "C" was added and identified as CC.3. In November of 2011, another eleven (11) columns were added to those being already monitored. They are located in rooms D-8 (identified as D8.1 and D8.2), A-19 (identified as A19.2), A-18 (identified as A18.2), A-15 (identified as A15.1), room A-11 (identified as A11.1), room A-3 (identified as A3.1 and A3.2), room A-2 (identified as A2.1), room E-16 (identified as E16.1), and room E-12 (identified as E12.1). In May 2012, one (1) additional column was added to those being monitored. The column is in room E-22 (identified as E22.1). Whether noted or not, all measurements are approximate.

Refer to the table included in Appendix A for column measurements from all WBCM monitoring site visits performed between November 2009 and May 2017.

ROOM D-8:

D8.1: Although its lateral movement has either remained unchanged or showed a decrease variation of 1/16", it was tied to the existing exterior wall per the May 2012 monitoring recommendations. WBCM is no longer monitoring this column.

D8.2: Although its lateral movement has varied, the readings are either a 1/16" or 1/8" larger than in November 2011. In the May 2012 monitoring recommendations, this column was slated to be braced and has been done. The readings taken November 4, 2014 indicated no lateral movement change in the

N-S direction and an increase of $1/16''$ in the E-W direction when compared to the May 2014 reading. This increase results in the column being back at the November 11, 2013 location. The readings between November 2014 and November 2016 indicated no change. Room D-8 was not accessible during our May 2017 site visit due to voting occurring in the room, therefore no measurements were taken at this column.

CORRIDOR "D":

DC.1: Since November 2009, its lateral movement has been varying but has been either equal to or less than its original reading. Since May 2014, no change has occurred.

DC.2: Since November 2009, its lateral movement has been pretty constant but has been either less than or equal to its original reading. Between March 2015 and May 2015, the column lateral movement increased $1/16''$. Since May 2015, no change has occurred.

DC.3: Since November 2009, its lateral movement has been pretty constant. Between November 2013 and May 2014, the lateral movement increased $1/16''$ and between May 2014 and November 2014, the column movement decreased $1/16''$ and is at its November 2009 location. Since November 2014, no change has occurred.

ROOM A-19:

A19.1: The lateral movement of this column, which was reinforced during the summer of 2009, has since November 2010 varied between (+) $1/16''$ to (-) $1/8''$ in the E-W direction from its original reading and (-) $1/8''$: max in the N-S direction from its original reading. Since November 2012, the readings in both directions have been unchanged.

A19.2: The lateral movement of this column in the E-W direction has moved from being plumb to being $3/16''$ out of plumb at the November 2012 reading to $1/8''$ at the May 2013 reading and in the N-S direction has decreased a $1/16''$ as compared to November 2011. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been done. This column is unchanged since May 2013.

ROOM A-18:

A18.1: Since November 2010, the lateral movement of this column increased $1/8''$ between November 2010 and May 2011, decreased $1/16''$ in November 2011, and has remained unchanged since November 2011. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced.

A18.2: Since November 2011, the lateral movement of this column has decreased $1/4''$ in the E-W direction and $1/16''$ in the N-S direction. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. Between May 2013 and May 2014, the column lateral movement decreased $1/16''$ in the E-W direction and increased $1/16''$ in the N-S direction to its November 2011 position. Between May 2014 and March 2015, the column remained unchanged in both directions. Between March 2015 and May 2015, the column lateral movement increased $1/16''$ in the E-W direction and decreased $1/16''$ in the N-S direction. Since May 2015, no change has occurred.

ROOM A-15:

A15.1: Since November 2011, the lateral movement of this column that increased 1/16" in the E-W direction has decreased 1/16" thereby returning to its November 2011 position. The lateral movement in the N-S direction has remained unchanged. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. Between November 2012 and March 2016, no change occurred. Between March 2016 and November 2016, the lateral movement increased 1/16" in the E-W direction, and no change occurred in the N-S direction. Between November 2016 and May 2017, no change occurred in either direction.

ROOM A-11:

A11.1: Since November 2011, the lateral movement of this column continued to decrease in the E-W direction up until May 2015, and in the N-S direction has either remained unchanged or has decreased or increased by 1/16". In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. Between November 2013 and May 2014, the lateral movement decreased 1/16" in the E-W direction and increased 1/16" in the N-S direction to its November 2011 position. Between May 2014 and March 2015, the column remained unchanged. Between March 2015 and May 2015, the column lateral movement increased 1/16" in the E-W direction and decreased 1/16" in the N-S direction. This change results in the column being back at the November 6, 2012 location. Between May 2015 and November 2016, no change occurred. Between November 2016 and May 2017, the column lateral movement increased 1/16" in the E-W direction and no change occurred in the N-S direction.

ROOM A-3:

A3.1: In a three (3) month period between November 2011 and February 2012, the lateral movement in the E-W direction increased 1/2". However, since then, the column in that direction has remained unchanged. In the N-S direction, the lateral movement has decreased 1/8" between November 2011 and May 2013. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. Between May 2013 and November 2015, no change occurred. Between November 2015 and March 2016, no change occurred in the E-W direction, and the lateral movement increased 1/16" in the N-S direction. Since March 2016, no change has occurred.

A3.2: Between November 2011 and November 2013, the lateral movement in both directions increased 1/16" although the column has moved back to its original position (November 2011) at the May 2013 reading. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. Between May 2013 and November 2013, the lateral movement in the E-W direction increased 1/16" and between November 2013 and May 2014, the lateral movement in the E-W direction increased 1/16" and decreased 1/8" in the N-S direction. Between May 2014 and November 2014, the column remained unchanged in the E-W direction and increased 1/16" in the N-S direction. Between November 2014 and November 2016, the column remained unchanged. Between November 2016 and May 2017, the column lateral movement decreased 1/16" in the E-W direction and no change occurred in the N-S direction.

ROOM A-2:

A2.1: Since November 2011, the lateral movement in the E-W direction has increased $1/16''$ but has remained the same between November 2012 and May 2014. Between May 2014 and November 2014, the column lateral movement in the E-W direction decreased $1/16''$ and is at its November 2011 location. The lateral movement in the N-S direction has been more cyclic. Since November 2011, the lateral movement has increased $1/8''$ (November 2013) and has decreased $3/16''$ (May 2012). Since May 2014, the lateral movement has not changed, and is $1/16''$ greater than its initial November 2011 reading.

CORRIDOR "C":

CC.1: The lateral movement of this column, which was reinforced during the summer of 2009, has fluctuated since November 2009 by increasing $1/16''$ or decreasing $1/8''$. At this point in time, it is at the same position it was in November 2009. Since May 2014, the lateral movement has remained unchanged.

CC.2: The lateral movement of this column, which was reinforced during the summer of 2009, has fluctuated since November 2009 by increasing $3/16''$ (November 2011) or decreasing $1/8''$ (November 2010). At the February 2012 reading, it was $1/16''$ more than it was November 2009. Between February 2012 and November 2015, the readings remained unchanged. Between November 2015 and March 2016, the lateral movement increased $1/16''$ in the N-S direction. Between March 2016 and May 2017, no change occurred.

CC.3: The lateral movement of this column, which was reinforced during the summer of 2009, has remained unchanged since May 2011.

CORRIDOR "B":

BC.1: The lateral movement of this column since November 2009 has increased $1/8''$ (May 2011) but has remained unchanged since May 2011.

BC.2: The lateral movement of this column since November 2009 has fluctuated by increasing either a $1/8''$ or a $1/16''$ with it being a $1/16''$ more than it was in November 2009. Since July 2012, no change has occurred.

ROOM E-22:

E22.1: The lateral movement of this column since May 2012 has either remained unchanged (N-S direction) or has decreased a maximum of $1/8''$ (E-W direction). In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. Between November 2014 and March 2015, the E-W lateral movement increased $1/16''$. Between March 2015 and May 2015, the E-W lateral movement decreased $1/16''$ to its November 2014 position. Between May 2015 and November 2015, no change occurred. Between November 2015 and March 2016, no change occurred in the N-S direction, and the lateral movement increased $1/16''$ in the E-W direction. Between March 2016 and May 2017, no change has occurred.

ROOM E-16:

E16.1: The lateral movement of this column has fluctuated since its initial November 2011 reading by moving (+/-) 1/16" in the E-W direction and (-) 3/16" to (+) 1/16" in the N-S direction. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced. In the six (6) month period between November 2013 and May 2014, the lateral movement decreased 1/16" in the E-W direction and remained unchanged in the N-S direction. Between May 2014 and November 2014, the E-W lateral movement increased 1/16" to its November 2013 position while the N-S lateral movement remained unchanged. Between November 2014 and March 2016, the column readings remained unchanged. Between March 2016 and November 2016, the lateral movement remained unchanged in the E-W direction and increased 1/16" in the N-S direction. Between November 2016 and May 2017, no change occurred.

ROOM E-12:

E12.1: The lateral movement of this column in the E-W direction, which decreased 3/16" between November 2011 and February 2012, had remained unchanged until November 2013 when the movement increased 1/16". The readings in the N-S direction when compared to the November 2011 readings have moved (+) 1/8" to (-) 1/16". Although the lateral movement in the N-S direction had been unchanged since November 2012, between May 2014 and November 2014, it decreased 1/8". Between November 2014 and March 2015, the lateral movement in the E-W direction remained unchanged and increased 1/8" in the N-S direction that corresponds to its May 2014 reading. Between March 2015 and May 2017, the column readings have remained unchanged. In the May 2012 monitoring recommendations, this column was slated to be reinforced and has been reinforced.

FLOOR ELEVATIONS:

There are nineteen (19) locations that have been monitored since April 2009. Those locations are three (3) in corridor "B" that are identified as MP #1, MP #2, and MP #3; four (4) in the cafeteria that are identified as MP #4, MP #5, MP #6, and MP #7; three (3) in the kitchen that are identified as MP #8, MP #9, and MP #10; one (1) in the teacher's lounge that is identified as MP #11; and three (3) in corridor "C" that are identified as MP #12, MP #13, and MP #14; two (2) in corridor "A" that are identified as MP #15 and MP #16; and three (3) in corridor "D" identified as MP #17, MP #18, and MP #19.

In November 2010, six (6) additional locations were added to those being monitored. They are all in room D-8 and identified as MP #20 thru MP #25. In July 2011, another sixty-one (61) locations were added to those being already monitored. They are located in corridor "B" (identified as #1 thru #9), cafeteria (identified as #1 thru #6), room E-16 (identified as #1 thru #9), corridor "C" (identified as #1 thru #7), room E-20 (identified as #1), E-22 (identified as #1 thru #7), corridor "E" in the vicinity of corridor "D" (identified as #1 thru #5), corridor "D" (identified as #1 and #6 with #1 being common to both corridors "D" and "E"), room A-17 (identified as #1), room A-14 (identified as #1 thru #3), room A-15 (identified #1 thru #10), room A-6 (identified as #1), and room A-2 (identified as #1). In November 2011, a monitoring point in the office and in front of the vault was added (identified #1). Whether noted or not, all elevation changes are approximate.

The cafeteria monitoring points were established April 2009 and supplemented in July 2011. The monitoring points were removed for the floor renovation that took place during the summer of 2014, and nine (9) new monitoring points were established in the new floor area.

Refer to the tables included in Appendix A for floor elevation measurements from all WBCM monitoring site visits performed between April 2009 and May 2017.

CORRIDOR "B":

Two (2) of the original three (3) monitoring points between April 2009 and November 2009 moved approximately 5/16" with the third moving approximately 7/16". Between November 2009 and July 2011 when nine (9) additional floor monitoring points were added, these original three (3) monitoring points moved to within approximately 1/4", 1/8", and 5/16" from its original April 2009 location.

Comparing the July 2011 location to the May 2014 location, the approximate variations in vertical position are 3/16" (one location), 1/4" (two locations), 1/8" (3 locations), 1/16" (3 locations), and no difference (3 locations). Between November 2013 and May 2014, six (6) monitoring points changed 1/16". It should be noted that the adjacent masonry wall and floor areas show no signs of distress. During the six (6) month period between May and November 2014, nine (9) points remained unchanged, two (2) decreased in elevation approximately 1/16", and one (1) monitoring point (at the intersection of Corridors "B"/"E") could not be read. During the seven (7) month period between November 2014 and June 2015, seven (7) points remained unchanged, three (3) points increased in elevation approximately 1/16", and two (2) monitoring points increased in elevation approximately 1/8". During the five (5) month period between June 2015 and November 2015, eight (8) points remained unchanged, three (3) monitoring points increased in elevation approximately 1/16", and one (1) one monitoring point decreased in elevation approximately 1/16". During the four (4) month period between November 2015 and March 2016, ten (10) points were unchanged, and two (2) monitoring points increased in elevation approximately 1/16". During the eight (8) month period between March 2016 and November 2016, seven (7) points were unchanged, two (2) monitoring points increased in elevation approximately 1/16", and three (3) monitoring points decreased in elevation approximately 1/16".

During the six (6) month period between November 2016 and May 2017, six (6) points were unchanged, one (1) monitoring point increased in elevation approximately 1/8", four (4) monitoring points increased in elevation approximately 1/16", one (1) monitoring point decreased in elevation approximately 1/16".

As previously observed, the floor area joint east of the center courtyard column is raised about 3/16". If this joint becomes a tripping hazard, the joint should be ground smooth.

CAFETERIA:

During the summer of 2014, the portion of the elevated structural floor that had moved upward (and being monitored) was removed and replaced along with a section of a supporting grade beam that was cracked due to its upward movement. As a result of this restoration, all floor monitoring points were lost and nine (9) new monitoring points were established in the new floor area. In addition, the partial removal of an existing grade beam that supported column C-2 resulted in this column lowering

approximately 7/8" and is marked on the column. Between November 2014 and June 2015; five (5) points increased approximately 1/8", one (1) increased approximately 3/16", one (1) increased approximately 1/16", and two (2) decreased approximately 1/16". Between June 2015 and November 2015, seven (7) points remained unchanged, and two (2) points increased in elevation by approximately 1/16". Between November 2015 and March 2016, two (2) points were unchanged, three (3) points increased in elevation by approximately 1/16", three (3) points decreased in elevation by approximately 1/16", and one (1) point decreased in elevation approximately 3/16". Between March 2016 and November 2016, four (4) points were unchanged, three (3) points increased in elevation by approximately 1/16", and two (2) points decreased in elevation by approximately 1/16".

Between November 2016 and May 2017, two (2) points were unchanged, two (2) points increased in elevation by approximately 1/8", four (4) points increased in elevation by approximately 1/16", and one (1) point decreased in elevation by approximately 1/16".

KITCHEN:

While the three (3) original monitoring points since April 2009 to May 2013 have moved 5/16" (MP #8), 3/16" (MP #9), and 1/4" (MP #10), these changes have not induced cracks or any noticeable effects. Since July 2011 when additional points were added within the school, two (2) of these points have moved approximately 1/8" and the third point approximately 1/16". Between November 2013 and May 2014, two (2) monitoring points changed 1/16" and the third was unchanged. From May 2014 to November 2014, all three (3) monitoring points were unchanged. From November 2014 to June 2015, all three (3) points decreased in elevation approximately 1/16". From June 2015 to November 2015 and from November 2015 and March 2016, all three (3) monitoring points remained unchanged. From March 2016 to November 2016, two (2) monitoring points remained unchanged, and one (1) point increased in elevation by approximately 1/16".

From November 2016 to May 2017, all three (3) monitoring points remained unchanged.

The monitoring of the points established by the RMD has shown movements since April 2009 of between 3/16" to less than 1/16". The various elevation notations are noted on the wall areas near the cafeteria/kitchen door, the locker room wall, and the sink wall nearest the locker room.

TEACHER'S LOUNGE:

The only monitoring point (near the door adjacent to the women's room) that was established in April 2009 has moved approximately 1/4" with any change being no more than at approximately 1/16" increments. Between November 2014 and June 2015, the monitoring point raised 1/16". Between June 2015 and November 2015, the monitoring point increased in elevation approximately 1/16". Between November 2015 and March 2016, the monitoring point increased in elevation approximately 1/16". Between March 2016 and November 2016, the monitoring point increased in elevation approximately 1/16". During this time period, the HI (height of instrument) monitoring point decreased in elevation approximately 1/16".

Between November 2016 and May 2017, the monitoring point decreased in elevation approximately 1/16". During this time period, the HI (height of instrument) monitoring point increased in elevation approximately 1/16".

ROOM E-16:

Since July 2011 when the location points were added, no point has moved more than approximately 1/8" (3 locations between February 2012 and May 2012) at any time and only three (3) points have moved approximately 1/8" (net) during this time. Between November 2013 and May 2014, one (1) monitoring point changed approximately 1/8", three (3) monitoring points changed 1/16", and five (5) remained unchanged. Between May 2014 and November 2014, one monitoring point changed 1/16" and the other points remained unchanged. Between November 2014 and June 2015; four (4) points increased approximately 1/16", two (2) points increased 1/8", one (1) point decreased 1/16", and the remaining two (2) were unchanged. Between June 2015 and November 2015, seven (7) points increased approximately 1/16", and two (2) points remained unchanged. Between November 2015 and March 2016, one (1) point decreased approximately 1/16", and eight (8) points were unchanged. Between March 2016 and November 2016, one (1) point decreased approximately 1/16", two (2) points increased approximately 1/16", and six (6) points were unchanged.

Between November 2016 and May 2017, three (3) points increased approximately 1/16", and six (6) points were unchanged.

The monitoring of the points in Room E-16 established by the RMD continues to have minor movements which seem to correlate with seasonal changes. The movements noted to date have been approximately (+/-) 1/16".

CORRIDOR "C":

Since April 2009, one (1) of the original three (3) monitoring points has moved approximately 3/8", one (1) has moved approximately 5/16", and one (1) has moved approximately 3/16". Since July 2011 when additional points were added within the school, these same original points moved a net gain of approximately 1/16" (two points) or 1/8" (one point). These changes have not induced cracks or any noticeable effects.

Of the seven (7) monitoring points added in July 2011, three (3) moved for a net gain of approximately 1/16", one (1) approximately 1/8", and three (3) showed no change between July 2011 and March 2015.

Between November 2013 and May 2014, the monitoring points were unchanged; and between May 2014 and November 2014, one monitoring point changed 1/16" and the other points remained unchanged. Between November 2014 and June 2015; two (2) monitoring points changed (+) 1/16", five (5) changed (-) 1/16", and the other three (3) were unchanged.

Between June 2015 and November 2015, two (2) points increased in elevation approximately 1/16", one (1) point decreased in elevation approximately 1/16", one (1) point increased in elevation approximately 1/8", and six (6) points were unchanged.

Between November 2015 and March 2016, seven (7) points decreased in elevation approximately 1/16", and three (3) points were unchanged.

Between March 2016 and November 2016, one (1) point decreased in elevation approximately 1/16", one (1) point decreased in elevation approximately 1/8", and eight (8) points were unchanged.

Between November 2016 and May 2017, one (1) point decreased in elevation approximately 1/16", three (3) points increased in elevation approximately 1/16", and six (6) points were unchanged.

ROOM E-20:

The monitoring point established in July 2011 and had remained unchanged until November 2014, showed a 1/16" lowering (decrease) of the floor between November 2014 and June 2015. Between June 2015 and March 2016, the monitoring point remained unchanged. During our November 2016 and May 2017 site visits, the monitoring point was not accessible.

ROOM E-22:

The seven (7) monitoring points established in July 2011 have moved no more than approximately 1/16" except two (2) points that have moved approximately 1/8" in approximately 1/16" increments. Between November 2013 and May 2014, three (3) monitoring points changed 1/16" and the remaining four (4) points are unchanged. Between May 2014 and November 2014, three (3) monitoring points changed 1/16" and the remaining four (4) points remained unchanged. Two (2) of the monitoring points that changed are at the November 2013 elevation and the third is 1/16" higher than before. Between November 2014 and June 2015, four (4) monitoring points moved (+/-) 1/16" and three (3) monitoring points were unchanged. Between June 2015 and November 2015, one (1) point increased in elevation approximately 1/16", and six (6) points remained unchanged. Between December 2015 and March 2016, four (4) points increased in elevation approximately 1/16", and three (3) points were unchanged. Between March 2016 and November 2016, one (1) point increased in elevation approximately 1/16", and six (6) points were unchanged.

Between November 2016 and May 2017, two (2) points increased in elevation approximately 1/16", and five (5) points were unchanged.

ROOM D-8:

Six (6) monitoring points were established in November of 2010. Since that time, one (1) point in the floor has cyclically moved approximately 1/8" in approximately 1/16" increments. The other points either remained unchanged or changed approximately 1/16". Between November 2013 and May 2014, two (2) monitoring points changed 1/16". Between May 2014 and November 2014, three (3) of the previously unchanged points are 1/16" higher than in May 2014 and the other points are unchanged. Between November 2014 and June 2015, three (3) points moved (+/-) 1/16" and three (3) points were unchanged. During our November 2015 site visit, Room D-8 was not accessible due to voting occurring

in the room, therefore readings were not taken at these monitoring points. Between November 2015 and March 2016, two (2) points increased in elevation approximately 1/16" and four (4) points were unchanged. Between March 2016 and November 2016, one (1) point decreased in elevation approximately 1/16", two (2) points were unchanged, and three (3) points were not accessible.

During our May 2017 site visit, the monitoring points in Room D-8 were not accessible due to voting occurring in the room.

INTERSECTION AREA OF CORRIDORS "D" and "E":

Five (5) monitoring points were established in July 2011. One (1) monitoring point has moved approximately 1/8" (in approximately 1/16" increments) and the remaining points have moved approximately 1/16". Between May 2013 and November 2013, one (1) monitoring point changed 1/16" and another monitoring point changed 1/8". Between November 2013 and May 2014, the monitoring point that previously had changed 1/8", decreased 1/16" and the remaining four (4) points were unchanged. Between May 2014 and November 2014, all points remained unchanged. Between November 2014 and June 2015, two (2) points decreased in elevation approximately 1/16" and three (3) points were unchanged. Between June 2015 and November 2015, one (1) point increased in elevation approximately 1/16", one (1) point decreased in elevation approximately 1/16", and three (3) points were unchanged. Between November 2015 and March 2016, three (3) points decreased in elevation approximately 1/16", and two (2) points were unchanged. Between March 2016 and November 2016, two (2) points decreased in elevation approximately 1/16", and three (3) points were unchanged.

Between November 2016 and May 2017, two (2) points increased in elevation approximately 1/16", and three (3) points were unchanged.

CORRIDOR "D":

The original three (3) monitoring points that were set in April 2009 have moved approximately 1/8" (MP #17), 1/8" (MP #18), and 1/8" (MP #19) between April 2009 and July 2011. In July 2011, two (2) additional monitoring points were added. Both monitoring points have moved approximately 1/8" and are within 1/16" of the July 2011 reading. In this same time frame, original monitoring points MP #17 and MP #18 are at the July 2011 reading and MP #19 that had moved approximately 3/16" between July 2011 and November 2013 remained unchanged. Due to the difficulty of locating MP #17, this point that has previously moved 1/8" since April 2009, is no longer being monitored. Since May 2014, one (1) monitoring point moved downward 1/16" to its November 2013 location and one (1) monitoring point moved downward 1/16" from its November 2013/May 2014 location. Between November 2014 and June 2015 one point decreased in elevation approximately 1/16", and three (3) points decreased in elevation approximately 1/8". Between June 2015 and November 2015, all four (4) monitoring points were unchanged. Between November 2015 and March 2016, two (2) points increased in elevation approximately 1/16", and two (2) points were unchanged. Between March 2016 and November 2016, one (1) point increased in elevation approximately 1/16", and three (3) points were unchanged.

Between November 2016 and May 2017, three (3) points increased in elevation approximately 1/16", and one (1) point was unchanged.

INTERSECTION AREA OF CORRIDORS "A" and "D":

In April 2009, two (2) monitoring points were set. Between April 2009 and May 2013, these two (2) points have cyclically moved approximately 1/4" (MP #15) and 3/16" (MP #16). In July 2011 when additional monitoring points were added in other areas of the school, these points had cyclically moved approximately 1/4" and 3/16" respectively. The point that had moved approximately 1/4" between April 2009 and July 2011 remained unchanged. The other point moved back approximately 1/8" in the next 6 months and since has been moving at approximately 1/16" increments so that it is within approximately 1/16" of its April 2009 reading. These two (2) monitoring points were unchanged between November 2012 and November 2014. Between November 2014 and June 2015, one (1) point increased in elevation 1/16", and the other point remained unchanged. Between June 2015 and March 2016, these two (2) monitoring points remained unchanged. Between March 2016 and November 2016, these two (2) monitoring points decreased in elevation approximately 1/16".

Between November 2016 and May 2017, one (1) monitoring point decreased in elevation approximately 1/16" and one (1) monitoring point was unchanged. During this time period, the HI (height of instrument) monitoring point decreased in elevation approximately 1/16".

ROOM A-17:

The monitoring point that was established July 2011 and that has shown no change moved approximately 1/16" between July 2012 and November 2012 and remained unchanged between November 2012 and May 2014. Between May 2014 and November 2014, this point moved up 1/16" and between November 2014 and June 2015 the monitoring point remained unchanged. Between June 2015 and November 2015, the monitoring point increased in elevation approximately 1/16". Between November 2015 and November 2016, the point remained unchanged. In November 2016, the point was approximately 3/16" higher than at the initial reading from July 2011.

During our May 2017 site visit, Room A-17 was not accessible.

ROOM A-14:

Three (3) monitoring points were established in July 2011. Two (2) points have moved approximately 1/8" at approximately 1/16" increments and the third point has moved approximately 1/16". Between November 2013 and May 2014, the three (3) monitoring points remained unchanged. Sometime between May 2014 and November 2014, the existing floor crack being monitored was covered with some type of black rubber strip. The measurements taken from the top of this strip during our site visits in November 2015 and June 2015. It appears as if the monitoring points remained unchanged. Between November 2014 and June 2015, two (2) points moved down 1/16" and one (1) point remained unchanged. Because of the difficulty of locating and measuring the monitoring points due to the black rubber strip that was installed over the points along the crack in the floor, after the June 2015 readings, the points in this room are no longer being monitored unless conditions change.

ROOM A-15:

Ten (10) monitoring points were established in July 2011. The difference in elevation between the July 2011 reading and the May 2013 reading is approximately 1/8" (3 locations), 1/16" (5 locations), and no change (2 locations). Between May 2013 and November 2013, five (5) monitoring points changed 1/16". Between November 2013 and May 2014, seven (7) monitoring points were unchanged and three (3) changed approximately 1/16". Between May 2014 and November 2014, one (1) point changed 1/16" (back to its November 2012/May 2013 location). The remaining points are unchanged. Between November 2014 and June 2015: four (4) monitoring points moved up 1/8"; three (3) moved up 1/16"; and two (2) remained unchanged. Between June 2015 and November 2015, three (3) monitoring points increased in elevation approximately 1/16" and six (6) points remained unchanged. Between November 2015 and March 2016, one (1) monitoring point decreased in elevation approximately 1/16" and eight (8) points remained unchanged. Between March 2016 and November 2016, one (1) monitoring point increased in elevation approximately 1/16", and eight (8) points remained unchanged.

Between November 2016 and May 2017, five (5) monitoring points increased in elevation approximately 1/16", and four (4) points remained unchanged. Eight (8) of the nine (9) monitoring points are at a higher elevation compared to the original readings taken in July 2011, and one (1) point is at the same elevation. Six (6) of the eight (8) points that have had a net increase in elevation in that time are within approximately 1/4" from the original July 2011 reading, one (1) point is approximately 5/16" higher, and one (1) point is approximately 3/8" higher compared to the July 2011 reading.

ROOM A-6:

The monitoring point established in July 2011 and showed approximately 1/16" movement between November 2011 and February 2012 remained unchanged until May 2014 when it increased 1/16" from the November 2013 reading. Between May 2014 and June 2015, this point remained unchanged. Between June 2015 and November 2015, the monitoring point increased in elevation approximately 1/16". Between November 2015 and March 2016, the monitoring point increased in elevation approximately 1/16". Between March 2016 and November 2016, the monitoring point elevation did not change.

During our May 2017 site visit, Room A-6 was not accessible.

ROOM A-2:

The monitoring point established in July 2011 moved down approximately 1/16" between November 2011 and February 2012. Between November 2014 and June 2015, this point moved up approximately 1/16", which corresponds to the original reading taken in July 2011. Since June 2015, this monitoring point has remained unchanged.

OFFICE VAULT:

The monitoring point established in November 2011 and located near the vault door showed an approximate 1/16" movement between November 2011 and February 2012 and has remained

Mr. Randall Skrinjorich

unchanged since then. The monitoring point was established when WBCM was informed that at one point in time, the vault door was difficult to open since the floor had risen shortly after this floor had been "flooded". This monitoring point, which is no longer visible and has shown little change, is no longer being monitored unless conditions change.

SUMMARY:

Monitoring Photos:

Most of the monitoring points indicated no additional movement, at locations that did indicate movement; the movement was 1/16" or less.

RMD Monitoring Points:

The measurements taken indicated movements of approximately (+/-) 1/16" or less.

Column Plumbness:

Most of the column measurements indicated no movement, with four (4) columns indicating movements of approximately 1/16".

Floor Elevations:

Most of the floor elevation measurements taken indicate either no movement or movements of 1/16". One floor measurement in Corridor "B" and two measurements in the Cafeteria indicated movements of approximately 1/8".

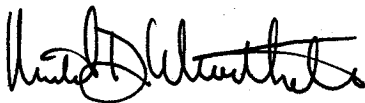
CONCLUSION:

Although this structure continues to move, based on our May 16, 2017 site visit, it is my opinion that the school is structurally safe. WBCM will perform a monitoring site visit in November 2017.

Should you have any questions or need further assistance, please contact me at (412) 221-5385.

Sincerely,

WHITNEY BAILEY COX & MAGNANI, LLC



Michael D. Wuerthele, P.E.
Senior Vice President

cc: file
Matt Franz (HHS DR Architects/Engineers)

P:\2013\13054600\Monitoring\Monitoring #9 (Task 0313)\Ringgold Middle School Monitoring_2017.05.16 Site Visit.doc

Appendix A

Tables

EXISTING 1ST FLOOR COLUMN MONITORING INFO																							
BUILDING AREA	LOCATION	DIRECTION	MEASUREMENTS (inches) (B/CEILING TO T/FLOOR: UNO)																				
			11/03/09	05/14/10	11/02/10	05/17/11	07/01/11	11/11/11	02/20/12	05/11/12	07/11/12	11/06/12	05/21/13	11/11/13	05/30/14	11/04/14	03/09/15	05/29/15	11/03/15	03/29/16	11/11/16	05/16/17	
ROOM D-8	D8.1	E-W	-	-	-	-	-	1 1/8	1 1/8	1 1/8	1 1/8	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4		
		N-S	-	-	-	-	-	3/4	11/16	3/4	3/4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4	NOTE 4		
	D8.2	E-W	-	-	-	-	-	13/16	13/16	13/16	13/16	7/8	15/16	7/8	13/16	7/8	7/8	7/8	7/8	7/8	7/8	NOTE 5	
		N-S	-	-	-	-	-	3/4	3/4	13/16	7/8	3/4	13/16	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	NOTE 5	
CORRIDOR "D"	DC.1	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	3/8	1/4	1/4	5/16	-	5/16	5/16	5/16	5/16	1/4	5/16	5/16	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	
	DC.2	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	5/16	5/16	1/4	5/16	-	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	3/8	3/8	3/8	3/8	3/8	3/8
	DC.3	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		N-S	5/8	9/16	9/16	5/8	-	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	11/16	5/8	5/8	5/8	5/8	5/8	5/8	5/8
ROOM A-19	A19.1	E-W	-	-	3/16	1/4	-	1/8	1/8	1/8	1/8	1/16	1/16	NA	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	
		N-S	-	-	1 1/2	1 1/2	-	1 1/2	1 1/2	1 1/2	1 3/8	1 7/16	1 7/16	NA	1 7/16	1 7/16	1 7/16	1 7/16	1 7/16	1 7/16	1 7/16	1 7/16	
	A19.2	E-W	-	-	-	-	-	0	- 1/16	- 1/16	- 1/8	- 3/16	- 1/8	NA	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	
		N-S	-	-	-	-	-	1 3/16	1 3/16	1 1/8	1 1/8	1 1/8	1 1/8	NA	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	
ROOM A-18	A18.1	E-W	-	-	11/16	13/16	13/16	3/4	3/4	3/4	3/4	3/4	3/4	NA	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	
		N-S	-	-	11/16	9/16	1/2	3/4	3/4	3/4	3/4	3/4	3/4	NA	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	
	A18.2	E-W	-	-	-	-	-	1 1/4	15/16	1 1/8	1 1/8	1 1/16	1 1/16	NA	1	1	1	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	
		N-S	-	-	-	-	-	9/16	1/2	1/2	1/2	1/2	1/2	NA	9/16	9/16	9/16	1/2	1/2	1/2	1/2	1/2	
ROOM A-15	A15.1	E-W	-	-	-	-	-	7/8	7/8	15/16	15/16	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	15/16	15/16	
		N-S	-	-	-	-	-	1/2	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	7/16	
ROOM A-11	A11.1	E-W	-	-	-	-	-	1 5/16	1 1/4	1 1/4	1 1/4	1 3/16	1 3/16	1 3/16	1 1/8	1 1/8	1 1/8	1 3/16	1 3/16	1 3/16	1 3/16	1 1/4	
		N-S	-	-	-	-	-	1/4	1/4	3/16	1/4	3/16	3/16	3/16	1/4	1/4	1/4	3/16	3/16	3/16	1/4	1/4	
ROOM A-3	A3.1	E-W	-	-	-	-	-	1/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	
		N-S	-	-	-	-	-	1 3/16	1 3/16	1 1/8	1 1/8	1 1/8	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/8	1 1/8	1 1/8	
	A3.2	E-W	-	-	-	-	-	7/16	1/2	1/2	1/2	1/2	7/16	1/2	9/16	9/16	9/16	9/16	9/16	9/16	9/16	1/2	
		N-S	-	-	-	-	-	1 1/4	1 1/4	1 1/4	1 1/4	1 5/16	1 1/4	1 1/4	1 1/8	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	
ROOM A-2	A2.1	E-W	-	-	-	-	-	5/16	5/16	5/16	5/16	3/8	3/8	3/8	3/8	5/16	5/16	5/16	5/16	5/16	5/16	5/16	
		N-S	-	-	-	-	-	13/16	7/8	5/8	13/16	7/8	7/8	15/16	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	
CORRIDOR "C"	CC.1	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	7/8	15/16	3/4	13/16	-	13/16	13/16	13/16	7/8	13/16	13/16	13/16	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	
	CC.2	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	1	1	7/8	1 1/16	-	1 3/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/8	1 1/8	1 1/8	
	CC.3	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	-	-	-	5/8	-	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8
ROOM E-22	E22.1	E-W	-	-	-	-	-	-	1 3/16	1 3/16	1 1/8	1 1/8	1 1/8	1 1/16	1 1/16	1 1/8	1 1/16	1 1/16	1 1/8	1 1/8	1 1/8	NOTE 6	
		N-S	-	-	-	-	-	-	NOTE 2 ->	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	NOTE 6	
ROOM E-16	E16.1	E-W	-	-	-	-	-	9/16	9/16	1/2	1/2	5/8	9/16	5/8	9/16	5/8	5/8	5/8	5/8	5/8	5/8	5/8	
		N-S	-	-	-	-	-	1/4	1/16	1/4	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	3/8	3/8	
ROOM E-12	E12.1	E-W	-	-	-	-	-	1/2	5/16	5/16	5/16	5/16	5/16	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	
		N-S	-	-	-	-	-	5/8	3/4	9/16	11/16	3/4	3/4	3/4	3/4	5/8	3/4	3/4	3/4	3/4	3/4	3/4	
CORRIDOR "B"	BC.1	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	9/16	5/8	5/8	11/16	-	11/16	11/16	NOTE 1	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/16	
	BC.2	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	1/2	9/16	1/2	9/16	-	9/16	5/8	NOTE 1	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	9/16	
	BC.3	E-W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N-S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

NOTES:

- STUDENT DISPLAYS DID NOT ALLOW MEASUREMENTS TO BE TAKEN ON 5/11/12 SITE VISIT.
- THE READING AT COL E22.1 (N-S) OF 15/16" ON 5/11/12 WAS INCORRECT. THE USE OF A ONE (1) INCH EXTENSION FOR THE PLUMB LINE NOT DEDUCTED. READING SHOULD HAVE BEEN -1/16". THIS HAS BEEN CORRECTED IN THE SPREADSHEET.
- ROOM NOT ACCESSIBLE.
- COL D8.1 HAS BEEN TIED TO EXTERIOR WALL. MONITORING NO LONGER REQUIRED.
- ROOM D-8 WAS NOT ACCESSIBLE DURING MAY 2017 SITE VISIT DUE TO VOTING OCCURRING IN ROOM.

BUILDING AREA	LOCATION	ELEVATION (ft)																				COMMENTS		
		04/09/09	11/03/09	05/14/10	11/02/10	05/17/11	07/01/11	11/11/11	02/20/12	05/11/12	07/11/12	11/06/12	05/21/13	11/11/13	05/30/14	11/04/14	03/09/15	05/29/15	06/09/15	11/03/15	03/29/16		11/11/16	05/16/17
CORRIDOR "B"	HI	4.195	4.220	4.210	4.210	4.205	4.205	4.210	4.210	4.210	4.010	4.210	4.210	4.210	4.210	4.210	4.210	4.210	4.210	4.210	4.210	4.210	4.210	HI: NORTH FACE OF HSS5X5 BLDG COL (1'-6" FROM COL FACE)
	MP #1	4.030	4.030	4.040	4.020	4.020	4.020	4.020	4.020	4.020	4.020	4.020	4.020	4.015	4.015	4.015	4.060	4.050	4.010	4.010	4.005	4.005	3.995	
	MP #2	4.280	4.280	4.280	4.280	4.280	4.280	4.280	4.280	4.280	4.280	4.280	4.280	4.285	4.285	4.285	4.310	4.305	4.285	4.285	4.285	4.285	4.290	
	MP #3	3.955	3.950	3.960	3.960	3.960	3.960	3.960	3.960	3.995	3.955	3.955	3.955	3.960	3.955	3.955	4.020	4.015	3.950	3.955	3.955	3.950	3.945	
	#1	-	-	-	-	-	4.000	4.000	4.000	NOTE 1	4.000	3.995	3.995	3.995	3.990	3.990	4.040	4.040	3.990	3.985	3.985	3.980	3.980	
	#2	-	-	-	-	-	4.235	4.240	4.235	4.235	4.235	4.235	4.240	4.240	4.240	4.240	4.265	4.270	4.240	4.240	4.240	4.240	4.240	
	#3	-	-	-	-	-	4.260	4.260	4.260	4.260	4.260	4.260	4.265	4.265	4.265	4.265	4.290	4.290	4.265	4.265	4.265	4.270	4.270	
	#4	-	-	-	-	-	4.280	4.280	4.275	4.275	4.280	4.280	4.280	4.280	4.280	4.280	4.310	4.300	4.280	4.280	4.280	4.285	4.285	
	#5	-	-	-	-	-	4.255	4.250	4.250	4.250	4.250	4.250	4.255	4.255	4.255	4.290	4.285	4.255	4.255	4.255	4.255	4.255	4.255	
	#6	-	-	-	-	-	4.000	3.990	3.995	NOTE 1	3.995	3.990	3.995	3.990	3.985	3.990	4.025	4.035	3.980	3.975	3.975	3.975	3.970	
#7	-	-	-	-	-	4.020	4.015	4.015	NOTE 1	4.015	4.010	4.010	4.010	4.005	4.010	4.055	4.060	4.000	4.000	3.995	4.000	3.995		
#8	-	-	-	-	-	4.250	4.250	4.250	4.250	4.250	4.250	4.250	4.250	4.255	4.255	4.285	4.280	4.250	4.250	4.250	4.250	4.250		
#9	-	-	-	-	-	4.150	4.150	4.150	4.150	4.145	4.145	4.150	4.150	4.150	4.150	4.185	4.185	4.150	4.145	4.145	4.145	4.140		
CAFETERIA	HI	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.340	4.345	4.350	4.350	4.350	4.350	4.350	HI: FROM SCREW ON WEST FACE OF MASONRY COL ENCLOSURE (1'-6" FROM COL FACE)
	#1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.190	4.190	4.230	4.190	4.190	4.190	4.185	4.180	
	#2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.295	4.295	4.325	4.295	4.290	4.295	4.290	4.290	
	#3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.340	4.340	4.355	4.340	4.340	4.345	4.340	4.335	
	#4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.180	4.175	4.220	4.180	4.180	4.175	4.175	4.170	
	#5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.350	4.360	4.395	4.365	4.365	4.370	4.370	4.370	
	#6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.355	4.365	4.390	4.370	4.370	4.385	4.385	4.390	
	#7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.535	4.525	4.580	4.530	4.530	4.525	4.530	4.520	
	#8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.505	4.500	4.540	4.505	4.500	4.500	4.500	4.490	
#9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.465	4.460	4.495	4.470	4.470	4.465	4.470	4.465		
KITCHEN	HI	4.510	4.510	4.510	4.510	4.510	4.500	4.500	4.500	4.500	4.505	4.505	4.500	4.505	4.510	4.510	4.515	4.510	4.510	4.510	4.510	4.510	4.510	HI: FROM SCREW ON NORTH FACE OF MASONRY PIPE ENCLOSURE (1'-6" FROM COL FACE)
	MP #8	4.840	4.850	4.850	4.850	4.850	4.850	4.850	4.850	4.850	4.855	4.850	4.855	4.855	4.855	4.860	4.875	4.860	4.860	4.860	4.860	4.860		
	MP #9	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.405	4.400	4.400	4.400	4.400	4.400	4.405	4.405	4.405	4.405	4.405	4.405	4.400	4.400	
	MP #10	4.740	4.745	4.745	4.745	4.745	4.750	4.750	4.750	4.750	4.750	4.750	4.750	4.750	4.755	4.755	4.760	4.775	4.760	4.760	4.760	4.760	4.760	
TEACHERS LOUNGE	HI	4.420	4.425	4.425	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.425	4.420	4.420	4.425	4.415	4.420	4.415	HI: WEST FACE OF HSS5X5 BLDG COL (1'-0" FROM COL FACE)
	MP #11	4.340	4.340	4.340	4.340	4.335	4.335	4.330	4.335	4.330	4.325	4.325	4.325	4.330	4.330	4.330	4.325	4.350	4.325	4.325	4.320	4.320	4.320	
ROOM E-16	HI	-	-	-	-	-	4.310	4.310	4.310	4.315	4.315	4.315	4.315	4.315	4.310	4.310	4.310	4.310	4.315	4.315	4.315	4.315	4.315	HI: (1'-9" FROM COL FACE)
	#1	-	-	-	-	-	4.285	4.285	4.290	4.285	4.290	4.285	4.285	4.290	4.285	4.285	4.285	4.300	4.285	4.280	4.285	4.280	4.275	
	#2	-	-	-	-	-	4.160	4.160	4.160	4.160	4.160	4.160	4.160	4.160	4.160	4.155	4.150	4.170	4.155	4.150	4.150	4.150		
	#3	-	-	-	-	-	3.955	3.955	3.955	3.955	3.955	3.950	3.950	3.950	3.950	3.950	3.945	3.960	3.950	3.945	3.945	3.940	3.940	
	#4	-	-	-	-	-	4.310	4.310	4.310	4.315	4.315	4.315	4.315	4.315	4.310	4.310	4.310	4.310	4.315	4.315	4.315	4.315	4.315	
	#5	-	-	-	-	-	4.185	4.185	4.185	4.185	4.185	4.185	4.185	4.185	4.180	4.180	4.180	4.190	4.185	4.180	4.180	4.180	4.180	
	#6	-	-	-	-	-	3.990	3.990	3.990	3.995	3.995	3.990	3.990	3.990	3.990	3.990	3.990	4.005	3.985	3.980	3.980	3.980	3.980	
	#7	-	-	-	-	-	4.315	4.315	4.315	4.315	4.315	4.315	4.315	4.315	4.310	4.310	4.315	4.320	4.320	4.315	4.315	4.320	4.315	
	#8	-	-	-	-	-	4.200	4.200	4.205	4.200	4.200	4.205	4.205	4.200	4.205	4.205	4.200	4.215	4.200	4.200	4.200	4.200	4.200	
#9	-	-	-	-	-	4.060	4.060	4.060	4.055	4.055	4.055	4.055	4.055	4.050	4.050	4.050	4.080	4.050	4.045	4.045	4.045	4.040		

BUILDING AREA	LOCATION	ELEVATION (ft)																				COMMENTS	
		04/09/09	11/03/09	05/14/10	11/02/10	05/17/11	07/01/11	11/11/11	02/20/12	05/11/12	07/11/12	11/06/12	05/21/13	11/11/13	05/30/14	11/04/14	03/09/15	05/29/15	06/09/15	11/03/15	03/29/16		11/11/16
CORRIDOR "C"	HI	4.515	4.515	4.510	4.510	4.510	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.505	4.500	4.505	5.505	HI: SOUTH FACE OF HSS5X5 BLDG COL (1'-6" FROM COL FACE)
	MP #12	4.050	4.050	4.050	4.050	4.050	4.050	4.060	4.050	4.050	4.055	4.050	4.050	4.050	4.050	4.050	4.050	4.090	4.055	4.050	4.050	4.050	
	MP #13	4.455	4.460	4.460	4.460	4.460	4.460	4.460	4.460	4.460	4.460	4.465	4.465	4.465	4.465	4.465	4.465	4.480	4.460	4.465	4.460	4.460	
	MP #14	4.485	4.490	4.490	4.490	4.490	4.490	4.490	4.500	4.495	4.495	4.495	4.495	4.500	4.500	4.500	4.500	4.550	4.500	4.500	4.500	4.495	
	#1	-	-	-	-	-	4.140	4.140	4.135	4.135	4.130	4.130	4.130	4.135	4.135	4.135	4.130	4.170	4.140	4.135	4.130	4.140	
	#2	-	-	-	-	-	4.465	4.465	4.465	4.465	4.465	4.465	4.470	4.470	4.470	4.465	4.465	4.485	4.470	4.470	4.465	4.470	
	#3	-	-	-	-	-	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.485	4.495	4.485	4.485	4.485	4.485	
	#4	-	-	-	-	-	4.410	4.410	4.405	4.405	4.405	4.405	4.410	4.405	4.405	4.405	4.405	4.415	4.405	4.405	4.405	4.405	
ROOM E-20	HI	-	-	-	-	-	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.765	4.765	4.765	4.765	HI: (1'-6" FROM COL FACE)
	#1	-	-	-	-	-	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.680	4.680	4.660	4.660	4.660	NOTE 6	
ROOM E-22	HI	-	-	-	-	-	4.575	4.575	4.575	4.580	4.580	4.580	4.580	4.580	4.580	4.580	4.580	4.580	4.580	4.580	4.580	4.580	HI: (1'-6" FROM COL FACE)
	#1	-	-	-	-	-	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.415	4.420	4.420	4.420	4.415	4.415	4.415	
	#2	-	-	-	-	-	4.310	4.310	4.310	4.310	4.310	4.315	4.315	4.310	4.310	4.310	4.310	4.320	4.305	4.305	4.300	4.300	
	#3	-	-	-	-	-	4.385	4.385	4.385	4.385	4.385	4.385	4.385	4.385	4.385	4.385	4.380	4.385	4.400	4.380	4.380	4.375	
	#4	-	-	-	-	-	4.580	4.580	4.580	4.580	4.575	4.575	4.575	4.575	4.580	4.575	4.575	4.585	4.580	4.575	4.575	4.575	
	#5	-	-	-	-	-	4.585	4.585	4.590	4.590	4.585	4.585	4.590	4.585	4.590	4.585	4.590	4.600	4.595	4.595	4.590	4.590	
	#6	-	-	-	-	-	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.495	4.480	4.480	4.480	4.480	
ROOM D-8	HI	-	-	-	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	4.680	NOTE 4	4.680	4.680	HI: (1'-3" FROM COL FACE)
	MP #20	-	-	-	4.660	4.660	4.655	4.655	4.655	4.655	4.655	4.655	4.655	4.655	4.655	4.660	4.655	4.655	4.660	NOTE 4	4.660	4.660	
	MP #21	-	-	-	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.655	4.660	4.660	NOTE 4	4.655	4.660	
	MP #22	-	-	-	4.650	4.650	4.650	4.650	4.650	4.650	4.650	4.650	4.650	4.650	4.650	4.645	4.645	4.650	4.650	NOTE 4	4.650	4.650	
	MP #23	-	-	-	4.475	4.470	4.475	4.480	4.475	4.480	4.475	4.475	4.470	4.475	4.470	4.470	4.470	4.480	4.465	NOTE 4	4.465	NOTE 6	
	MP #24	-	-	-	4.465	4.460	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.460	4.460	4.460	4.470	4.460	NOTE 4	4.460	NOTE 6	
CORRIDOR "D" & "E"	HI	-	-	-	-	-	4.730	4.730	4.730	4.735	4.735	4.735	4.735	4.735	4.735	4.735	4.735	4.735	4.740	4.740	4.735	4.740	HI: CORRIDOR "D" (1'-6" FROM COL FACE) HI CORRIDOR "E" (1'-6" FROM COL FACE)
	#1	-	-	-	-	-	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.740	4.725	4.725	4.725	4.725	
	#2	-	-	-	-	-	4.665	4.665	4.665	4.665	4.665	4.665	4.665	4.665	4.665	4.665	4.675	4.665	4.670	4.665	4.670		
	#3	-	-	-	-	-	4.670	4.665	4.670	4.670	4.670	4.665	4.665	4.670	4.670	4.670	4.665	4.675	4.670	4.670	4.670	4.670	
	#4	-	-	-	-	-	4.705	4.705	4.705	4.705	4.705	4.705	4.705	4.705	4.705	4.705	4.705	4.710	4.710	4.705	4.710	4.705	
CORRIDOR "D"	HI	4.610	4.615	4.615	4.615	4.615	4.620	4.625	4.625	4.625	4.625	4.625	4.630	4.625	4.625	4.625	4.625	4.630	4.630	4.630	4.630	4.630	HI: NORTH FACE OF METAL CORRIDOR PANEL WALL ADJACENT TO DOOR (1'-6" FROM COL FACE)
	MP #17	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.765	4.770	4.765	-	-	-	-	-	-	-	-	
	MP #18	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.720	4.725	4.725	4.730	4.730	4.730	4.730	4.730	4.730	4.730	4.725	
	MP #19	4.300	4.300	4.295	4.295	4.295	4.300	4.295	4.295	4.295	4.295	4.295	4.295	4.295	4.290	4.295	4.295	4.305	4.290	4.290	4.285	4.280	
	#1	-	-	-	-	-	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.440	4.415	4.415	4.410	4.405	
	#6	-	-	-	-	-	4.420	4.415	4.415	4.415	4.415	4.415	4.420	4.420	4.420	4.420	4.420	4.425	4.415	4.415	4.415	4.410	

EXISTING 1ST FLOOR ELEVATION/ MONITORING INFO (TOP OF LASER BEAM) - PAGE 3 OF 3

BUILDING AREA	LOCATION	ELEVATION (ft)																				COMMENTS		
		04/09/09	11/03/09	05/14/10	11/02/10	05/17/11	07/01/11	11/11/11	02/20/12	05/11/12	07/11/12	11/06/12	05/21/13	11/11/13	05/30/14	11/04/14	03/09/15	05/29/15	06/09/15	11/03/15	03/29/16		11/11/16	05/16/17
CORRIDOR "A"	HI	4.440	4.440	4.440	4.450	4.450	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.465	4.470	4.470	4.470	4.470	4.475	HI: WEST FACE OF METAL CORRIDOR PANEL ADJ TO STAIR'S MASONRY WALL (1'-6" FROM COL FACE)	
	MP #15	4.470	4.470	4.475	4.475	4.475	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.480	4.485	4.485	4.485	4.485	4.485		
	MP #16	4.440	4.450	4.450	4.450	4.450	4.450	4.460	4.460	4.460	4.455	4.455	4.460	4.460	4.460	4.460	4.485	4.485	4.460	4.460	4.460	4.465		4.465
ROOM A-17	HI	-	-	-	-	-	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	NOTE 3	HI: (2'-0" FROM COL FACE)	
	#1	-	-	-	-	-	4.590	4.590	4.590	4.590	4.590	4.585	4.585	4.585	4.585	4.580	4.600	4.600	4.580	4.575	4.575	4.575		NOTE 3
ROOM A-14	HI	-	-	-	-	-	4.620	4.620	4.620	4.620	4.620	4.620	4.620	4.615	4.615	4.620	4.610	4.610	4.615	NOTE 5	NOTE 5	NOTE 5	NOTE 5	HI: NORTH FACE OF METAL CORRIDOR PANEL WALL ADJACENT TO DOOR (2'-6" FROM COL FACE)
	#1	-	-	-	-	-	4.525	4.520	4.520	4.520	4.520	4.520	4.515	4.515	4.515	4.505	4.520	4.520	4.500	NOTE 5	NOTE 5	NOTE 5	NOTE 5	
	#2	-	-	-	-	-	4.545	4.540	4.540	4.540	4.540	4.540	4.535	4.535	4.535	4.525	4.540	4.540	4.525	NOTE 5	NOTE 5	NOTE 5	NOTE 5	
	#3	-	-	-	-	-	4.595	4.590	4.595	4.595	4.590	4.590	4.590	4.590	4.590	4.590	4.580	4.585	4.585	4.580	NOTE 5	NOTE 5	NOTE 5	
ROOM A-15	HI	-	-	-	-	-	4.675	4.680	4.680	4.680	4.675	4.675	4.675	4.675	4.675	4.675	4.675	4.675	4.675	4.675	4.675	4.675	HI: (3'-0" FROM COL FACE)	
	#1	-	-	-	-	-	4.490	4.490	4.490	4.490	4.490	4.490	4.485	4.485	4.485	4.485	4.490	4.485	4.480	4.480	4.480	4.475		4.475
	#2	-	-	-	-	-	4.505	4.505	4.505	4.500	4.500	4.500	4.500	4.495	4.495	4.495	4.510	4.510	4.490	4.485	4.485	4.485		4.480
	#3	-	-	-	-	-	4.700	4.705	4.705	4.705	4.705	4.700	4.700	4.700	4.700	4.700	4.700	4.705	4.700	4.700	4.700	4.700		4.700
	#4	-	-	-	-	-	4.700	4.700	4.700	4.700	4.700	4.695	4.695	4.700	4.700	4.695	4.695	4.700	4.695	4.695	4.695	4.695		4.695
	#5	-	-	-	-	-	4.605	4.605	4.605	4.605	4.600	4.600	4.595	4.600	4.595	4.595	4.605	4.605	4.590	4.590	4.590	4.590		4.585
	#6	-	-	-	-	-	4.560	4.560	4.560	4.550	4.555	4.550	4.550	4.550	4.550	4.550	4.570	4.565	4.540	4.540	4.540	4.540		4.540
	#7	-	-	-	-	-	4.660	4.660	4.660	4.660	4.655	4.655	4.655	4.660	4.655	4.655	4.680	4.675	4.645	4.645	4.645	4.645		4.640
	#8	-	-	-	-	-	4.585	4.585	4.585	4.585	4.585	4.580	4.580	4.580	4.580	4.580	4.580	4.610	4.605	4.570	4.565	4.570		4.565
	#9	-	-	-	-	-	4.590	4.585	4.585	4.585	4.585	4.580	4.580	4.580	4.580	4.580	4.610	4.605	4.570	4.565	4.565	4.565		4.560
#10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
ROOM A-6	HI						4.800	4.800	4.805	4.805	4.805	4.805	4.805	4.805	4.805	4.805	4.805	4.805	4.805	4.805	4.805	NOTE 3	HI: (1'-6" FROM COL FACE)	
	#1						4.625	4.625	4.625	4.625	4.625	4.625	4.625	4.625	4.620	4.620	4.635	4.635	4.620	4.615	4.610	4.610		NOTE 3
ROOM A-2	HI						4.730	4.730	4.730	4.730	4.730	-	4.730	4.730	4.730	4.730	4.730	4.730	4.730	4.730	4.730	4.730	HI: (1'-6" FROM COL FACE)	
	#1						4.650	4.650	4.655	4.655	4.655	-	4.655	4.655	4.655	4.655	4.665	4.665	4.650	4.650	4.650	4.650		4.650
OFFICE & VAULT	HI						-	4.535	4.540	4.540	NOTE 3	4.540	4.540	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	
	#1						-	4.570	4.570	4.570	NOTE 3	4.570	4.570	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA

NOTES:

- STUDENT DISPLAYS DID NOT ALLOW MEASUREMENTS TO BE TAKEN ON 5/11/12 SITE VISIT.
- BLACK RUBBER STRIP INSTALLED OVER CRACK IN FLOOR IN ROOM A-14 PRIOR TO SITE VISIT ON 11/4/14.
RUBBER STRIP COVERS 3 MONITORING POINTS. MEASUREMENTS TAKEN W/ STADIA ROD SITTING ON TOP OF RUBBER STRIP AT APPROXIMATE MONITORING POINT LOCATIONS.
- ROOM NOT ACCESSIBLE.
- ROOM NOT ACCESSIBLE DUE TO VOTING OCCURING IN ROOM.
- POINTS COVERED BY BLACK STRIP REFERENCED IN NOTE 2 ABOVE. POINTS NO LONGER BEING MONITORED.
- POINT COVERED BY CARPET THAT IS DUCT TAPED TO FLOOR. POINT NOT ACCESSIBLE