Moseley

Town of Black Mountain

Public Safety Building Facility Condition Assessment

February 5th, 2026

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Executive Summary

Project Scope

The Town of Black Mountain tasked Moseley with performing a facility condition assessment (FCA) and developing a capital improvement plan (CIP). Post Hurricane Helene the town had indicated that they witnessed flooding during the storm and since have noticed structural issues. This summary and subsequent report explain the process and findings of this project.

Facility Condition Assessment

The purpose of the Black Mountain Public Safety Building FCA is to visually evaluate the current condition of the building systems, estimate the remaining useful life of these systems, and develop a 10-year CIP for the facility based on these observations. The assessment results are then used to calculate the facility condition index (FCI) for the facility, which can be used to provide benchmarking and a high-level understanding of the building's condition.

Assessments

This FCA was to assess the architectural and engineering systems for the Town of Black Mountain facility. The FCA team consists of engineers and architects from Moseley. The FCA team assessed exterior envelope, architectural interiors, structural systems, mechanical/electrical/plumbing/fire protection systems, and life safety. This FCA process was comprised of three primary tasks:

This Report is broken out to only include the Site, Water intrusion and Structural items observed that were reported by the Town of Black Mountain to have been deteriorating since Helene.

1. Perform a visual comprehensive engineering condition assessment of components and systems for each facility to determine deficiencies and estimated remaining useful life.
2. Prioritize observed deficiencies, develop recommendations for corrective work, and specify schedule for repair or replacement over a 10-year planning window.
3. Develop planned replacement and renewal project solutions for deficiencies, or groups of deficiencies, to be included in a future CIP.

On December 18, 2025, the FCA team performed a visual physical condition assessment of the building. During this assessment we were assisted by Town of Black Mountain staff to provide both access to restricted parts of the building and institutional knowledge of the building system operations and problems.

Based on our FCA for the Black Mountain Public Safety Building, the following deliverables were created:

- Executive Summary – High-level summary of each component of the total report.
- Current Conditions Summaries – A summary of the existing systems at the building and the current FCI.
- Immediate Recommendations – A summary of the replacements, repairs, and actions that need to take place in the next fiscal year.
- Additional Recommendations – A summary of the replacements, repairs, and actions that need to take place in the two to three years after the next fiscal year.
- Capital Improvement Plan Matrix – A list of system replacements and required and recommended system maintenance for the designated planning window.

Priorities

Priorities are used for ranking systems and requirements, and to develop the needed maintenance program and deficiencies reports. The priorities are as follows:

Priority 1 – Currently High-Priority
Conditions require immediate action to correct a cited safety hazard, return a facility to operation, and/or stop accelerated deterioration.

Priority 2 – Potentially High-Priority
Conditions in this category, if not corrected expeditiously, will become high priority within 1-3 years. Situations in this category include intermittent operations, potential life safety hazards, and rapid deterioration.

Priority 3 – Necessary – Not Yet High-Priority
Conditions in this category require attention to preclude predictable deterioration or potential downtime and the associated damage or higher costs if needed further.

Priority 4 – Recommended
Conditions in this category include items that represent a sensible improvement to existing conditions. These are not required for the most basic function of the facility; however, Priority 4 projects will improve overall usability and/or reduce long-term maintenance costs and should be addressed.

Priority 5 – Does Not Meet Current Code/Standards
Conditions in this category include items that do not conform to existing codes but are “exempted” in their current condition. Substantial work should be undertaken, as certain existing conditions may require correction or may be required to be addressed during other replacement or renovation work.

Facility Condition Index

Moseley calculated a Facility Condition Index (FCI) for the Black Mountain Public Safety Building facility, based on the current year, 2025. The FCI is a ratio that defines the relative condition of a facility by comparing the cost of needed maintenance to the replacement value of the facility. The FCI enables the owner to compare the building's relative condition against other facilities and industry-standard metrics outlined below:

Facility Condition Index Value	Condition
0.00 – 0.04	Good Condition
0.05 – 0.09	Fair Condition
0.10 – 0.30	Poor Condition
> 0.30	High-Priority Condition

A high FCI value indicates the cost of maintenance and repair is a large percentage of the building's current replacement value. This information can be leveraged by the building owner to determine the most prudent areas to allocate their limited resources.

Findings

The total cost of site and structural repair is estimated at $1,162,153. The building's replacement value is $1,207,900 as provided from the 2021 Buncombe County appraised value for the building. This value does not include furniture, fixtures, and equipment (FFE) as these items were not in the scope of the FCA. The facility FCI is 0.77, which equates to a condition rating of high-priority.

Facility Condition Assessment

For the immediate future, within the next year, there is approximately $951,875 worth of repair that the Town of Black Mountain should address. However, the repairs should be prioritized and aligned with the facility goals to reduce the overall cost and projects to the critical actions while the facility/Town plans and budgets.

With a facility FCI of 0.77, or a "high-priority" rating, significant capital investment will be required to improve the facility and assure both buildings and systems will continue to serve the Town and staff. The existing building (not including the bays) is roughly 12,000 square feet. To demolish and build a new building of similar size would be estimated at $6,600,000 construction costs or roughly $8,000,000 total project costs at the current market conditions.

Based on the assessment, the building has major structural deficiencies that need to be addressed. Additional testing is required to determine the full scope of structural repairs that are necessary. Major deficiencies were noted for mechanical, plumbing, emergency power, and fire alarm systems. Substantial system replacements and/or renovations are needed to improve the facility's condition.

Based on these conditions the Town should proceed with the additional testing described herein to understand the scope and severity of the repairs and building condition. Given the building is currently occupied it should be considered to move to temporary facility until repairs or a better understanding of the cause of the structural failures is determined. Temporary Housing was not factored into the costs of repairs or replacement.

Next Steps

Now that the Town of Black Mountain has the data, results, and recommendations from this project, there are several next steps Moseley recommends.

Prioritization will be key to the facility's success. Needed maintenance and capital projects must be prioritized in order to meet Black Mountain's long-term goals and align facility spending with the goals.

The prioritization process will take time and most likely have several iterations. Moseley recommends the following actions to take place concurrently with prioritization:

1. Address the specific and known issues in high-priority building systems. This includes items noted as Priority 1- Currently High-Priority and Priority 5 – Does Not Meet Current Code/Standards.
2. Prioritize and plan for items that cannot be accomplished in the next year due to budget or other constraints. Realign these with the next two fiscal years and request budget to accommodate these projects and tasks.

In summary, the Town of Black Mountain Public Safety Building FCA and CIP project resulted in a significant amount of data and an understanding of the current facility and systems, as well as several plans that can be implemented to make progress; however, there are steps for the staff to take in the near future to be most successful in maintaining and managing the facility.

Current Conditions
Building Description

Site:

The large concrete apron in front of the apparatus bays has been recently replaced. There is a large crack running parallel with the bay. There is some settlement in the second bay. It is reported that during large precipitation events, water backs up into the bay. The asphalt around the building has many cracks and should be considered for replacement, especially on the east side.



Photo 1: Concrete drive.



Photo 2: Apparatus bay.



Photo 3: Settlement near apparatus bay.

Cracking was observed in the pavement along the east side of the building. Based on the CCTV video, a damaged and cracked pipe is located beneath this pavement and is likely contributing to excess subsurface moisture and resulting ground settlement. Pavement along the south side of the building is generally in good condition and slopes downward from the driveway entrance off Montreat Road toward the driveway connection at West Street. During the site inspection, it was observed that roof drains from the Public Safety Building are located within the sidewalk and daylight at the edge of the sidewalk. Roof runoff from the south side of the building likely drains

east toward the inlet adjacent to West Street. Pavement along the south side of the building, in front of the fire apparatus bays, is concrete, while the remaining pavement throughout the site is asphalt.

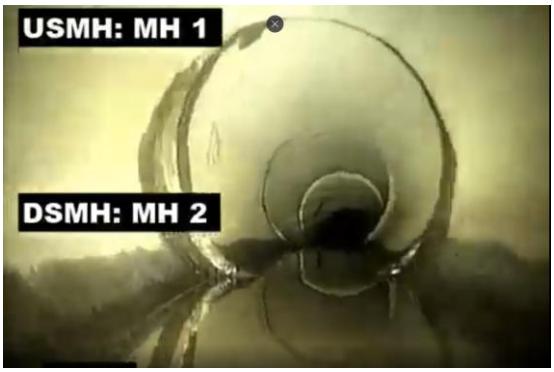
Drainage Observations

The damaged pipe referenced above conveys runoff from the grate inlet (located on the northeast side of the building) southward and ultimately connects to the grate inlet located at the West Street driveway of the Public Safety Facility. Another drainage structure is expected to be located between the inlet adjacent to West Street and the inlet on the northeast side of the building. However, this structure could not be located during the site visit. The presumed location was covered by a dumpster, and no inlet top was observed. Additionally, this area appears to have undergone pavement repairs following Hurricane Helene, which may have covered the inlet structure.

StreamStats (USGS web-based tool) was used to develop a preliminary estimate of the drainage area basin to the grate inlet at West Street. The inlet captures approximately 19.2 acres, of which 41% is impervious. We estimated that the upstream inlet located along the northeast side of the building captures approximately 15 to 16 acres of the total 19.2-acre drainage area that ultimately conveys to the inlet adjacent to West Street.

- The inlet's location along the north side of the building and the existing slope of the adjacent parking lot appear to direct runoff toward the building, which is not ideal.
- The inlet is not located at the lowest point along the northeast wall of the building, which may allow runoff to continue eastward toward the northeast corner of the structure.
- No trench drains or shallow swales were observed along the building that would redirect runoff toward the inlet and away from the building.









Water Intrusion:

The existing Roof appeared to be a modified bitumen roof on wooden bow trusses. There was evidence of water leaks at various ceilings as shown below.



Photo 4: Police department roof.



Photo 5: Water damage in fire station living room.



Photo 6: Water damage in police station bathroom.



Photo 7: Water intrusion near detective office.

Since this report was originally taken, new water damage has occurred in the police chief's office. This damage has also caused some bowing of the ceiling and cracks have formed along what appears to be the panel joints.

These phots were taken on March 26th, 2026.





Structural

A visual site inspection was conducted for the building on December 18th, 2025 to assess the existing structural systems of the building. Original construction drawings for the building were not available.

Description of Structure

The facility consists of a two-story building with a partial basement under the southeast corner, with offices for both the fire department and police department, and an attached apparatus room consisting of a pre-engineered metal building with bays for emergency vehicles.

The roof structure of the office building consists of steel bowstring trusses with wood joists spanning between them. The roof is supported on exterior CMU bearing walls clad with brick. The floor system over the basement area consists of a concrete slab over steel bar joists. The bar joists are supported on steel wide-flange girders which bear on steel columns and the exterior masonry walls.

A drainage pipe runs under the northeast corner of the building, starting near the men's restrooms and exits under the building between the training room and basement level. After viewing the video of the drainpipe inspection provided by the civil engineering firm McGill Associates, it is apparent that the drainpipe has many cracks. During our visit and during the video, water was actively flowing through this pipe.

The north and west basement walls have had a drain installed on the inside of the wall to help alleviate flooding due to water infiltration. The drain installation involved removing a strip of slab, removing the soil, and backfilling along the wall to catch water seeping through and under the wall and diverting it to the exterior. It is unknown if a drainage pipe was installed.

Structural Observations

Basement Level

Many of the perimeter basement walls within the basement footprint were covered up with storage materials making a thorough inspection of all of them difficult. However, at visible areas, primarily along the east wall, vertical and step cracks were visible. Additionally, evidence of the east wall moving away from the building was observed.

The existing floor framing appeared to be satisfactory.

Removing continuous strips of floor slabs adjacent to the bottom of the existing retaining walls is not advised for most retaining walls. Normally, basement walls will rely on the slab to restrain the bottom of the walls from sliding. When the slab is removed, this restraint is also removed, and the walls may become unstable.



Photo 8: Step cracking.

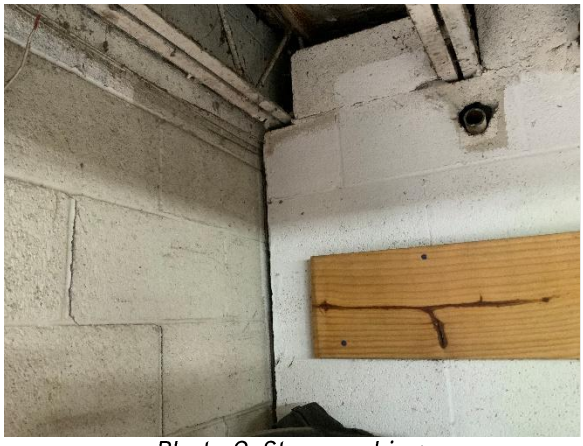


Photo 9: Step cracking.

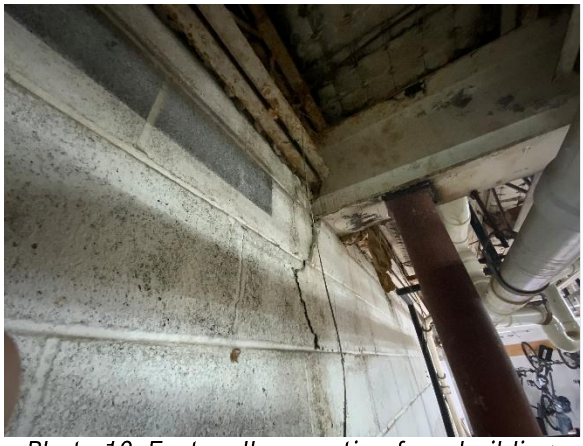


Photo 10: East wall separation from building.



Photo 11: Removed slab.



Photo 12: Removed slab.

Main Floor Level

Along the north side of the building, the building is single-story with a slab on grade. Within the veneer of the north wall, at floor level, there is a 1/4 inch tall horizontal crack running nearly the

length of the building. Additionally, the slab along this entire side of the building has experienced large cracks and differential settlements of up to one inch. Cracking in some of the gypsum covered walls is visible, and walls with brittle finishes, such as the tiled walls in the men's bathroom, are showing many cracks throughout the walls and floor areas. Evidence of the slab settlement is apparent where gaps between the top of the slab and bottom of the cove base is more than 1/2 of an inch. At one location, it appears that the wall ties that are attached to the slab are dragging the slab towards the exterior wall as the veneer moves. Distress due to settlement and reported roof leaks during Hurricane Helene are visible in the ceilings as well.



Photo 13: North wall horizontal crack.



Photo 14: Differential settlement in slab.



Photo 15: Differential settlement in slab.



Photo 16: Differential settlemtn in slab.



Photo 17: Crack in slab.



Photo 18: Crack in slab.



Photo 19: Crack in slab.



Photo 20: Cracks in gypsum board.



Photo 21: Cracks in wall tile.



Photo 22: Cracks in wall tile.

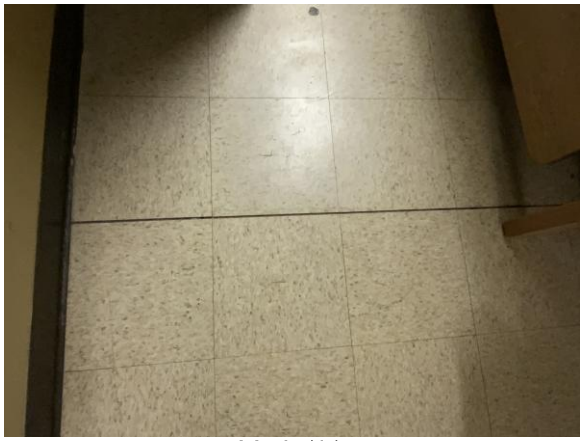


Photo 23: Shifting slab.



Photo 24: Gap between slab and cove base.



Photo 25: Gap between slab and cove base.



Photo 26: Gap between slab and cove base.



Photo 27: Crack in gypsum board.

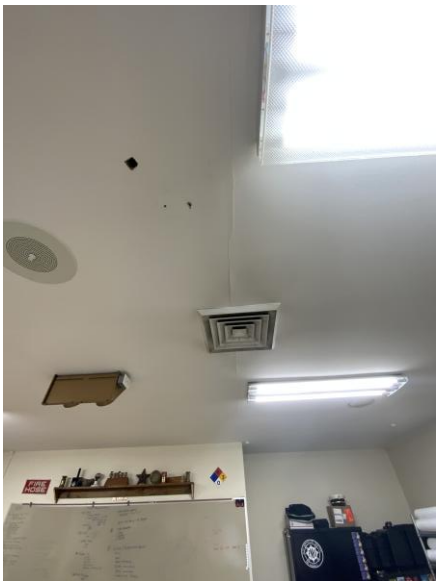


Photo 28: Ceiling distress.



Photo 29: Ceiling distress.



Photo 30: Ceiling distress.

The quarter circle windows at the dispatch office and fire chief office have both cracked, indicating excessive amounts of wall movement. The stone veneer around the door that leads to the apparatus bay has also cracked.



Photo 31: Cracked window.



Photo 32: Cracked window.



Photo 33: Cracked stone veneer.



Photo 34: Cracked stone veneer.

The floor slab in the apparatus bay appears to be in mostly good condition, with an increase in visible slab cracks as you approach the main building. These slab cracks may be due to normal shrinkage of the concrete slab. It is unusual, however, that the instance of cracking increases with the proximity to the main building with known settlement issues. It should be expected that some amount of soil stability issues may be a contributor to these cracks as well. Additionally, a video provided by Deputy Chief James Bingham shows the slab at the door threshold deflecting as the wheels of one of the fire trucks is driven over it, indicating a loss of bearing under the slab at this location.

The concrete apron in front of the apparatus bay appears to be in good condition with minimal cracking.



Photo 35: Apparatus bay slab crack.



Photo 36: Apparatus bay slab crack.



Photo 37: Apron in front of apparatus bay.



Photo 38: Apron in front of apparatus bay.

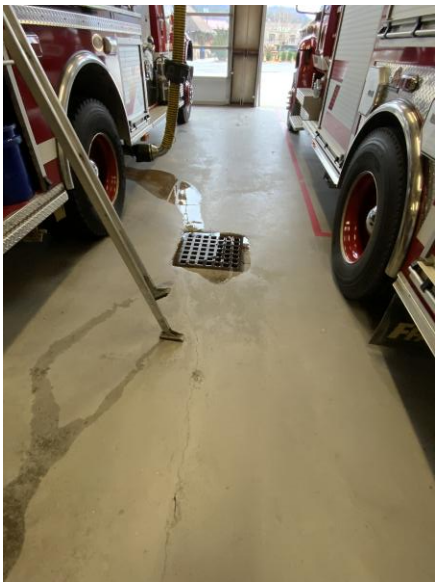


Photo 39: Apparatus bay slab crack.

Conclusions

It is readily apparent that the second-floor slabs and the building foundations have been compromised. In the facilities report that was presented on August 8, 2024 it appears that some of these issues were witnessed in 1985, with new ones being witnessed in the observations performed in both 2012 and 2018. These reports were not provided for our review. However, based on the pictures provided in the facilities report and anecdotal evidence provided during our walkthrough, these issues have steadily worsened and new ones have appeared.

The cracks, settlements, and wall movements are consistent with those caused by loss of bearing under the wall footings and slabs. The precise cause of these is unknown, but rainfall events, groundwater movement, and the cracked drainage pipe are likely contributors. Water movement is known to cause erosion, and broken drain lines can wash soil away, both creating hollow and soft spots under the facility.

Because the extents of these soft soils are unknown, it is recommended to perform borings in and around the facility. To get a realistic view of the soils below the building, borings will need to extend below the elevation of the cracked drain line. Moseley should be contacted to locate the borings and a specialty contractor with expertise in providing borings inside a structure should be contacted to gain insights into how this should be completed. It is also recommended to run a camera down the other drains in the facility to determine if any other drains are broken. After completion of this work, please contact Moseley with the results of these findings for further analysis.

Performing these investigations should be considered an immediate priority. Soft soils and voids below buildings can cause loss of structural stability and put the safety of the building occupants at risk.

FCI

The FCI for the Town of Black Mountain Public Safety Building, based on the 2025 facility condition assessment, is shown below. An FCI of 0.00 – 0.04 means the facility is in good condition. An FCI of 0.05 – 0.09 means the facility is in fair condition. An FCI of 0.10 – 0.30 means the facility is in poor condition. An FCI above 0.30 means the facility is in critical condition.

The Public Safety Building is in high-priority condition.

Town of Black Mountain Public Safety Building Facility Condition Index	Value
2025 Building Repair Cost[1]	1,162,153
Building Replacement Value[2]	$2,207,691
2025 Facility Condition Index Value	0.77

[1] Needed maintenance items recommended by Moseley through 2025 with general contractor fees, contingencies, and bonds/insurance fees included in $ amounts.

[2] Estimated building replacement value based on 2021 tax appraised value. Does not include FFE, contingency, or soft costs.

Immediate Recommendations

Immediate recommendations in this section are for the next year (Fiscal Year 2026) to help alleviate needed maintenance and manage the age of the building systems. While some of these items can be postponed, it is important to plan and budget for them in the near future.

Site

Priority 1 – Currently High-Priority

- Integrity: Conduct a water intrusion study to investigate the cause of water intrusion in interior corridor floors (FY26).
- Integrity: Conduct a water intrusion study to investigate cause of water intrusion into apparatus bay. Staff report that water backs up into the apparatus bay during large precipitation events (FY26).
- Integrity: Stormwater Pipe Repairs/ Reroute.

Priority 2 – Potentially High-Priority

- No items noted.

Priority 3 – Necessary-Not Yet High-Priority

- No items noted.

Priority 4 – Recommended

- No items noted.

Priority 5 – Does Not Meet Current Codes/Standards

- No items noted.

Water intrusion

Priority 1 – Currently High-Priority

- Integrity: End of life replacement of roof over police department building. Evidence of roof leaks is present throughout facility (FY26).

Structural

Priority 1 – Currently High-Priority

- Integrity: Perform soil borings in and around facility to determine the extent of the soft soils. Contact Moseley with the results for further analysis (FY26).
- Integrity: Scope drain pipes to identify and repair cracks (FY26).
- Integrity: Repair slab, wall, and ceiling cracks caused by structural movement. The scope of the repairs will depend on the results of the soil bearing study (FY26).

Priority 2 – Potentially High-Priority

- No items noted.

Priority 3 – Necessary-Not Yet High-Priority

- No items noted.

Priority 4 – Recommended

- No items noted.

Priority 5 – Does Not Meet Current Codes/Standards

- No items noted.

Capital Improvement Plan Matrix

The following pages contain the list of system replacements and required and/or recommended system maintenance for the designated planning window of 10 years. The first page is the master sheet with the totals for each year, broken down by priority. The subsequent sheets are items denoted by priority.

Each item on the capital improvement plan has a total cost that is comprised of the trade contractor cost (materials and labor), a 12% professional fee for design and review, a 3% permit & fees multiplier, and a 10% owner contingency. This total cost is then placed in the appropriate fiscal year of execution and a 6% inflation rate per year is applied.

For reference, the priorities are as follows:

Priority 1 – Currently High-Priority
Conditions require immediate action to correct a cited safety hazard, return a facility to operation, and/or stop accelerated deterioration.

Priority 2 – Potentially High-Priority
Conditions in this category, if not corrected expeditiously, will become high priority within 1-3 years. Situations in this category include intermittent operations, potential life safety hazards, and rapid deterioration.

Priority 3 – Necessary – Not Yet High-Priority
Conditions in this category require attention to preclude predictable deterioration or potential downtime and the associated damage or higher costs if needed further.

Priority 4 – Recommended
Conditions in this category include items that represent a sensible improvement to existing conditions. These are not required for the most basic function of the facility; however, Priority 4 projects will improve overall usability and/or reduce long-term maintenance costs and should be addressed.

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Conditions in this category include items that do not conform to existing codes but are “exempted” in their current condition. Substantial work should be undertaken, as certain existing conditions may require correction or may be required to be addressed during other replacement or renovation work.

Signed: _____, Date: 3-27-2026

Kevin McDade, AIA

NC



Signed: _____, Date: 3-27-2026

Steven Cooke, PE

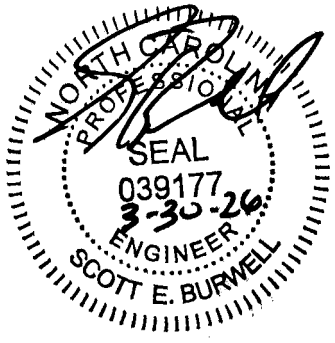
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Signed: _____, Date: 3-30-2026

Scott Burwell, PE

NC 039177



Moseley

Facility Condition Assessment

Priority 1 - Currently High-Priority

Town of Black Mountain Public Safety Building

Annual Inflation Escalation 6.00%

1 Year	2 to 5 Years	6 to 9 Years	10+ Years

	Project Information				Full Project Cost Estimate												
	Type	Action Year		Name	Description	Trade Contractor Subtotal	Prof. Fees 12%	Permit & Fees 3%	Owner Contingency 10%	Total Cost* (2025 $)	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35
1	Structural	0	Urgent (1 Year)	Drain Pipe Inspection	Scope drain pipes to identify and repair cracks.	$0	$0	$0	$0	**$0**										
2	Structural	0	Urgent (1 Year)	Soil Boring Study	Perform soil borings in and around facility to determine the extent of the soft soils. Contact Moseley with the results to for further analysis. Cost depends on the number and location of soil borings required, but is estimated to cost around $15,000-$20,000.	$20,000	$2,400	$600	$2,000	**$25,000**	$25,000									
3	Structural	0	Urgent (1 Year)	Allowance for Structural Repairs	Allowance for Structural Repairs based on Soil Boring Study.	$450,000	$54,000	$13,500	$45,000	**$562,500**	$562,500									
4	Site	1	Urgent (1 Year)	Stormwater Pipe Repair	Option A: Repair Existing Pipe Structural pipe lining1, flowable fill for cracks in pipe and voids underground, and a pump-around system for stormwater during repairs ($150,000) Option B: Stormwater System Reroute Fill existing pipe and voids with flowable fill, plug and abandon existing pipe, install three (3) new structures and new stormwater pipe, pavement repairs, and a pump-around system for stormwater during repairs ($250,000) 1Note: Structural pipe liner has a 100-year life span.	$250,000	$30,000	$7,500	$25,000	**$312,500**	$331,250									
5	Structural	1	Urgent (1 Year)	Structural Repairs	Repair slab, wall, and ceiling cracks, and bowing walls caused by structural settlement. Cost for repairs to be determined after the soil boring study.	$25,000	$3,000	$750	$2,500	**$31,250**	$33,125									
6	Architecture	1	Urgent (1 Year)	Police Station Roof	Replacement of roof over police department. Evidence of roof leaks is present throughout the facility.	$158,700	$19,044	$4,761	$15,870	**$198,375**	$210,278									
					Grand Totals	**$903,700**				**$1,129,625**	**$1,162,153**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

*Project Specific Overhead Includes Design Contingencies, Phasing Contingencies, and General Contractor Overhead and Profit Appropriate for Each Project

Recommendations that are considered strictly maintenance items with no capital impact are noted as $0 amounts. Assuming minor internal labor/material costs will be associated.

Moseley

Town of Black Mountain

Public Safety Building Facility Condition Assessment

-Amendment 01

May 22nd, 2026

Executive Summary – Amendment 01

Moseley has reviewed the Report of Exploratory Hand Auger Borings prepared by ESP, dated May 12, 2026 in regard to the Facility Condition Assessment that we completed. We also reviewed the subsurface exploration report prepared by ECS, dated July 18, 2011, the reports prepared by Medlock & Associates Engineering, dated March 5, 2012, October 31, 2019 and December 30, 2024.

Each of the geotechnical investigations indicate soft soils under and around the buildings, along with evidence of shallow water table at multiple locations. The Medlock & Associates Engineering reports document the buildings movement and degradation over the years and suggests repairs be made. We would suggest stabilizing the building, removing the groundwater, and providing appropriate site and wall drainage systems. As the soils under the building dry out, they will shrink, requiring additional remediation to compact and fill the resulting voids left behind. In addition to these measures, the existing storm water pipe under the building should be repaired and relocated outside of the building footprint.

As stated in the Exploratory report, it is our opinion that the presence of groundwater around and under the building will continue to cause settlement and degradation of the facility, creating and unsafe environment for the user and public, until repairs and remediation are made.

May 12, 2026

Kevin McDade
Moseley Design Group
6210 Ardrey Kell Road
The Hub at Waverly
Suite 425
Charlotte, NC 28277

Reference: **REPORT OF EXPLORATORY HAND AUGER BORINGS**
Black Mountain PSB
Black Mountain, North Carolina
ESP Project No. E4B: 26-00643

Dear Mr. McDade,

ESP Associates, Inc. (ESP) has completed exploratory hand auger borings at the existing Black Mountain PSB in Black Mountain, North Carolina. This exploration was performed in general accordance with Proposal No. 26-00643, dated March 16, 2026, and was authorized by Joshua N. Bennett on April 15, 2026, through execution of the Moseley Service Agreement.

PROJECT INFORMATION

ESP understands that distress has been observed in the concrete slab-on-grade and exterior veneer within the northeastern portion of the PSB building. The structure is understood to be of split-level construction, with reported cracking and differential settlement affecting both the basement and upper floor levels. Signs of settlement-related movement have also been observed along the exterior walls. Additionally, a storm drainage line is understood to extend beneath a portion of the upper-level structure, where water intrusion has been reported and subsurface moisture conditions beneath the slab-on-grade are suspected. Flooding within the basement has reportedly occurred during heavy rainfall events, with water intrusion observed through the retaining wall. In addition, we understand cracks have been observed within the southeast portion of the fire station slab.

PURPOSE OF SERVICES

The purpose of the exploration was to evaluate the general subsurface conditions within and adjacent to portions of the building where concrete slab-on-grade and/or veneer distress has been observed. The hand auger boring locations were selected by Mr. Kevin McDade with Moseley and located in the field by ESP.

FIELD EXPLORATION

As proposed, eight (8) hand-auger borings were performed at four (4) interior locations and four (4) exterior locations adjacent to the building foundations, as shown on the attached "Test Location Plan." Interior Borings B-03 and B-04 were advanced through the upper-level slab-on-grade, while borings B-01 and B-02 were performed through the basement-level slab-on-grade. Six-inch-diameter concrete cores were extracted at locations B-01 through B-04 and B-08 to facilitate access to the underlying subgrade soils. Core thickness measured approximately 4 inches. In addition, a six-inch-diameter asphalt core was extracted at location B-05 for subgrade access. The borings were advanced to depths ranging from approximately 3 to 11 feet below the existing ground surface and/or slab-on-grade elevation. Dynamic Cone Penetrometer (DCP) testing was performed at selected intervals within the hand-auger borings to estimate the strength and relative density of the near-surface bearing materials and to evaluate their suitability for foundation and slab-on-grade support. Temporary standpipes were installed in interior borings B-01 and B-04 for water level monitoring purposes.

The DCP test procedure used during the evaluation is as follows. The cone point of the penetrometer is first seated 2 inches into the bearing material to embed the point. The cone point is driven three 1- 3/4 inch intervals using a 15 pound weight falling 20 inches. The penetrometer test result is the number of blows required to drive the cone point 1-3/4-inches. The penetrometer test result is similar to the Standard Penetration Resistance (N-value), as defined by ASTM D 1586. When properly evaluated, the penetrometer test results provide an index for estimating soil strength and relative density.

The results of the visual soil classifications for the borings are presented on the attached "Daily Field Report." Similar soils were grouped into strata; however, the actual transition between soil types in the field may be gradual in both the horizontal and vertical directions.

FINDINGS

A stone layer of approximately 6 inches was encountered below the concrete slab-on-grade at Borings B-03 and B-04. At the existing ground surface in Hand Auger Borings B-06 and B-07, beneath the concrete slab-on-grade in B-01, B-02, and B-08, beneath the asphalt layer in B-05, and beneath the stone layer in Borings B-03 and B-04, fill soils were encountered. The fill soils generally consists of silty sands. Dynamic Cone Penetrometer values obtained in the fill soils varied between 2 and 22 blows per increment (bpi). Underlying the fill soils in Boring B-03, residual soils were encountered. The residual soils generally consists of sandy clay. Dynamic Cone Penetrometer values obtained in the residual soils varied between 3 and 6 blows per increment (bpi). Hand auger borings B-01, B-02 and B-04 through B-08 were terminated in the fill soils upon hand auger refusal. ESP visited the site on April 21, 2026 and April 29, 2026 to obtain water levels within the standpipes. The generalized subsurface water conditions encountered during our exploration are described below.

Test Location	Water Depth * at Time of Testing (feet)	Water Depth * 5 Days (feet)	Water Depth * 13 Days (feet)
B-01	1.2	1.0	0.8
B-02	1.5	NA	NA
B-04	NA	9.3	9.0

*Depth measured from the top of the slab-on-grade

CONCLUSIONS

Based on the results of the exploratory hand auger borings, the observed slab-on-grade and exterior veneer distress within the northeastern portion of the PSB structure appears to be associated with variable near-surface low consistency fill soils and/or near surface water beneath portions of the building. The soils encountered adjacent to the fire station appeared firm and suitable for foundation and slab support; however, shallow refusal was encountered; therefore, soils below those encountered may be variable. This conclusion is based upon the soils adjacent to or below those observed being consistent with our findings. Please refer to the attached “Daily Field Report” sheets for locations tested and specific results at each location.

Water monitoring performed within temporary standpipes installed at Borings B-01, B-02 and B-04 confirmed the presence of near surface water beneath the structure, with water levels observed between approximately 1.0 and 0.8 feet below the lower-level slab surface and 9 feet below the upper-level slab. These findings, combined with the reported history of stormwater intrusion, the presence of a storm drainage line beneath portions of the structure, and observed basement flooding through the retaining wall during heavy rainfall events, indicate that surface and/or subsurface water infiltration are likely adversely affecting the performance of the underlying bearing soils.

CLOSING

ESP appreciates the opportunity to assist you during this phase of the project. If you should have any questions concerning this letter, or if we may be of further assistance, please contact us.

Sincerely,

ESP Associates, Inc.

Matthew J. Amick
Project Manager

NORTH CAROLINA PROFESSIONAL SEAL 028947 ENGINEER D. CHAD SHERMAN
2026.05.12 15:21:44 -04'00'

D. Chad Sherman, PE
N.C. Registration No. 28947

Attachments: Daily Field Report (5 Sheets)
Test Location Plan (1 Sheet)

Daily Field Report

7144 Weddington Road, NW
Suite 110
Concord, NC 28027
Phone: 704.793.9855
Fax: 704-793-9865

Client:

Moseley Inc.
911 N. West Street
Suite 205
Raleigh, NC 27603

Project:

26-00643
Black Mountain PSB
black mountain, NC

Date: 04/15/2026 **Representative:** Davis, Christopher

General Info

Project-Phase: 26-00643-Geotechnical Engineering

Total Time for Day (hours): 0.00 **Total Site Time for Day (hours):** 0.00 **Mileage:** 0

Location: Black Mountain, North Carolina

Preliminary/Exploratory Boring

Test Location: B-01

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Tannish brown Sandy Silt (Fill)	1.0	5	6	5	5
		2.0	5	7	7	6
		3.0	5	5	5	5
		4.0	3	2	2	2
	Hand Auger Refusal at -5	5.0	5	5	9	6

Test Location: B-02

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Tannish brown silty sand (Fill)	1.0	7	8	6	7
		2.0	7	7	6	7
		3.0	3	4	4	4
		4.0	5	6	5	5
	Hand Auger Refusal at -5	5.0	5	7	7	6

Test Location: B-04

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Daily Field Report

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Project:

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black mountain, NC

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Washed Stone	1.0	8	7	7	7
0.5	Tannish brown silty sand (Fill)	2.0	3	4	4	4
		3.0	3	3	3	3
		4.0	3	3	4	3
		5.0	5	6	6	6
	Hand Auger Refusal at -6	6.0	5	6	9	7

Test Location: B-03

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Washed Stone	1.0	9	9	9	9
0.5	Tannish brown silty sand(Fill)	2.0	2	2	3	2
		3.0	3	3	4	3
		4.0	2	2	3	2
		5.0	5	5	6	5
		6.0	5	5	4	5
		7.0	2	3	3	3
7.0	Grayish brown silty sandy clay with organics and organic staining (Fill)	8.0	3	4	3	3
8.0	Grayish brown silty sandy clay (Res)	9.0	3	3	4	3
		10.0	4	4	5	4
	Hand Auger Refusal at -11	11.0	5	5	8	6

Test Location: B-08

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Project:

26-00643
Black Mountain PSB
black mountain, NC

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Tannish brown Sandy Silt (Fill)	1.0	9	9	11	10
		2.0	14	14	9	12
		3.0	10	10	11	10
	Hand Auger Refusal at -4	4.0	11	15	14	13

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Project:

26-00643
Black Mountain PSB
black mountain, NC

Date: 04/15/2026 **Representative:** Davis, Christopher

General Info

Project-Phase: 26-00643-Geotechnical Engineering

Total Time for Day (hours): 0.00 **Total Site Time for Day (hours):** 0.00 **Mileage:** 0

Location: Black mountain, North Carolina

Preliminary/Exploratory Boring

Test Location: B-05

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Tannish brown silty sand (Fill)	0.0	6	5	8	6
		1.0	5	10	10	8
		2.0	5	5	9	6
		3.0	6	7	7	7
	Hand Auger Refusal at -4	4.0	18	22	25	22

Test Location: B-06

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Tannish brown silty sand (Fill)	0.0	5	8	9	7
		1.0	6	6	7	6
		2.0	5	5	9	6
	Hand Auger Refusal at -3	3.0	10	15	15	13

Test Location: B-07

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black mountain, NC

Hand Auger Boring Data

Top of Strata (feet)	Soil Description	Test Depth (feet)	1st Increment (bpi)	2nd Increment (bpi)	3rd Increment (bpi)	Average Increment (bpi)
0.0	Tannish brown silty sand (Fill)	0.0	7	7	7	7
		1.0	6	5	6	6
		2.0	8	5	7	7
	Hand Auger Refusal at -3	3.0	15	14	18	16

Exploration Picture Observations:

The pictures here show the multiple attempts to extend a boring along the north side of the building (B-06 & B-07) to the depth required but was unsuccessful.

Sketch of Information:



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Service Layer
Garmin, USG
Esri Japan, M
Korea, Esri (T
contributors, a
Source: Esri,
the GIS User

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expressed or implied.