State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER	PAGE
DNRB11044	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
FRANK WHITTAKER
304-558-2316

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
DIVISION OF NATURAL RESOURCES
PARKS & RECREATION SECTION

324 4TH AVENUE
SOUTH CHARLESTON, WV
25303-1228 304-558-3397

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
11/16/2010				

BID OPENING DATE: 12/01/2010 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
				********** ADDENDUM NO. 1 **********		
				THIS ADDENSUM IS ISSUED TO PROVIDE THE ATTACHED TECHNICAL QUESTIONS AND ANSWERS AND STRUCTURAL REPORT SUMMARIES.		
				THE BID OPENING DATE AND TIME HAVE NOT CHANGED.		
				********** END ADDENDUM NO. 1 **********		
0001	1	LS		906-00-00-001		
				ARCHITECT/ENGINEERING SERVICES, PROFESSIONAL		
				****** THIS IS THE END OF RFQ DNRB11044 ****** TOTAL:		

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.

2. The State may accept or reject in part, or in whole, any bid.

3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required $125 fee.

4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.

5. Payment may only be made after the delivery and acceptance of goods or services.

6. Interest may be paid for late payment in accordance with the ***West Virginia Code***.

7. Vendor preference will be granted upon written request in accordance with the ***West Virginia Code***.

8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.

10. The laws of the State of West Virginia and the ***Legislative Rules*** of the Purchasing Division shall govern the purchasing process.

11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.

12. BANKRUPTCY: In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.

13. HIPAA BUSINESS ASSOCIATE ADDENDUM: The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at **www.state.wv.us/admin/purchase/vrc/hipaa.htm** and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

14. CONFIDENTIALITY: The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf.

15. LICENSING: Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

16. ANTITRUST: In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or Fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.

2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.

3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.

4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130

5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).

Addendum #1

EOI DNR B11044
A/E services for certain buildings at Hawks Nest, Twin Falls and Pipestem State Parks

Technical Questions

- Can we obtain a copy of the structural report completed by CAS Structural Engineer for each structure at each Resort?
  Copies of the summaries of each report are attached. The complete reports are not necessary for firms to determine if they may be qualified or interested in this project.

- Is there a construction cost estimate for each park? If yes, can you provide this information so we can see the magnitude of the project?
  Construction cost estimates or project budgets are not discussed at this point in the EOI process.

Structural Investigation
Twin Falls Resort State Park
Recreation Building & Lodge
Mullens, West Virginia

June 2004

CAS Structural Engineering, Inc.
Post Office Box 469 Alum Creek, West Virginia 25003-0469 (304)756-2564

I. INTRODUCTION AND GENERAL DESCRIPTION OF STRUCTURES

We performed a visual structural survey of the existing conditions of the Twin Falls Resort State Park Recreation Building and Lodge Building. The buildings were designed in 1967 and constructed shortly thereafter. Both buildings were constructed by the same architectural and engineering design team.

The purpose of this report is to document the existing conditions of the structures and to provide short-term and long-term recommendations for repair and associated probable construction costs. Due to the top surface of the pool deck being covered with carpet and EPDM rubber membrane, the observations were made mainly from the bottom side of the structure. The observations at the Lodge Building were made almost entirely from the exterior of the building structure.

Each section of this report is divided into two subsections; the Recreation Building and the Lodge Building. The Survey Observations and Existing Conditions are contained in Section II of the report, followed by the Structural Analysis in Section III and Recommendations for Repairs in Section IV. Photographs taken at the Recreation Building are located in Appendix A as are plans indicating conditions and photo locations. Appendix B contains photographs, condition information and photo locations related to the Lodge Building. The Repair Plans and Probable Construction Costs associated with the Recreation Building are located in Appendix C. Appendix D contains Repair Plans and Probable Construction Costs for the Lodge Building.

II. SURVEY AND EXISTING CONDITIONS

A. Recreation Building

The Recreation Building houses the golf course pro shop, the swimming pool and shower/locker rooms, and maintenance area for the golf course equipment. It is a two-story structure supported by pile foundations and a series of grade beams. The first floor, second floor and roof structure consists of hollow-core precast concrete planks supported by steel beams, concrete beams and brick piers/walls. The swimming pool is a reinforced concrete structure as well, also supported by grade beams and pile foundations. There have been a number of leaks over the years and cracks have developed at the brick piers at the maintenance bays. As a result, pipe columns have been installed to support the ends of the precast concrete beams at this location.

Figure 1, located in Appendix A, shows the Roof Framing Plan for the Recreation Building and indicates locations where photos were taken at the second floor level (pool, showers, and locker rooms). Figure 2 shows photos in the Maintenance Room, Maintenance Bays, and below the pool deck and structure. Photographs of exterior conditions of the Recreation Building are also indicated in this Figure. Photos of the pool structure from below the pool deck are shown in Figure 3. The sidewalks around the perimeter of the Recreation Building are shown in Figure 4, along with associated photo numbers.

This section of the report is divided into 6 areas as follows:

1. Toilet/Showers/Locker Rooms
2. Pool Deck and Pool Structure
3. Wading Pool
4. Maintenance Room and Maintenance Bays
5. Exterior Façade
6. Exterior Sidewalks and Paving

Each area will be discussed in reference to the conditions that were observed. The original drawings for the building structure were used for the analysis of the structural components.

1. Toilet/Showers/Locker Rooms

There are a number of areas where calcium has effloresced through the precast concrete or precast concrete beams. This is caused by water penetrating through the structure at the roof level. There also appears to be a significant amount of mold present in the area (Photos 27 through 42). In some locations there is evidence of extensive moisture infiltration most notably in the toilet rooms. The moisture damage has proceeded to the toilet room walls where ceramic tile has also come loose (Photos 38 through 40).

It appears that the skylights/roof vents are covered over during the off-season and no additional ventilation is provided to the space. As a result, the moisture infiltration and penetration leads to the growth of mold on the ceiling and walls. Maintenance personnel indicate that the toilet/shower rooms are cleaned with bleach each year prior to the opening of the pool. This approach would possibly be acceptable if there were not other facilities within the building that are open at other times of the year, such as the golf pro shop. There is a distinct moldy, mildewy smell in this area, which most likely is attributed to the moisture in the shower/toilet room space directly above the pro shop. The moisture has also caused rusting of the structural steel header member at the opening through the roof plank (Photo 32). Photos 43 through 48 depict conditions present just outside the shower rooms. There appears to be some rust present at the steel angle lintel over the door to the Women's Dressing Area.

There is an area of walkway at the second floor level with a steel railing system at the edge. The concrete has cracked along the edge as a result of the railing posts penetrating the concrete. The sealants at a joint in the concrete topping slab also appear to have failed. At one location, the railing post has rusted through completely. These conditions can be seen in Photos 49 through 58. There is evidence of rust staining on the exterior face of the precast concrete beams (see Photos 57 and 58). Photos 59 through 62 were taken on the interior face of the precast concrete beams at the walkway elevation (from below the walkway). There is some efflorescence present at the precast plank joints and also rust staining is present on this face of the precast concrete beams.

2. Pool Deck and Pool Structure

The pool deck consists of hollow core precast concrete plank supported by concrete precast concrete beams. There is a topping slab on the plank. Also, to keep water from penetrating through the plank and tapping slab, the pool deck has been covered with an EPDM rubber membrane and outdoor carpeting. At the same level as the pool deck is a picnic area near the concession space. There is a chain-link fence around the pool deck area with posts installed in the concrete. Photos of these conditions are shown in Photos 1 through 3, 11, and 15 through 24. In a number of locations the concrete is cracked where the fence posts are set (see photos 19 and 24). It appears that these areas have been repaired in the past but are in need of more attention. There are also open joints at the corners where the precast concrete beams meet (see photos 18 and 23). The sealants that have been applied at both locations have failed, allowing water to penetrate the structure at these locations easily.

The pool itself can be seen in the Photos 3, 8, 11, 21, 25 and 26. There are a few cracks in the bottom of the pool that have been noted on Figure 1. As noted previously, the pool is a reinforced concrete structure supported by concrete columns, grade beams, and a pile foundation system. As seen in Photo 22, only one diving board is still being utilized. Originally there were two diving boards, but since the concrete is deteriorating at one of the diving blocks exposing the reinforcing steel bars (see Photo 89), the board at this location has been removed. Photos 92 and 93 show the precast concrete plank, structural steel beams, and concrete diving blocks at the deep end of the pool and pool deck.

Access to the area under the swimming pool deck and the structure of the pool is from within the Maintenance Bay Area. Photos 128 through 162 show the conditions present in this area. There are numerous locations where water and calcium has effloresced through the concrete structure or plank. The concrete cover over the reinforcing steel bars is very minimal to non-existent in many locations, allowing the exposed rebar to rust. Longitudinal reinforcing bars, dowel bars, and column stirrups are all exposed. In some places, the concrete has spalled (see Photos 138 and 139) and in others, the concrete is cracked and ready to spall off (see Photo 156). The steel lintels shown in Photos 157 and 158 that support a section of masonry are also rusted. Water penetrating through the pool deck and pool structure has led to many of these problems. There are a few small spalls in the bottom face of the precast plank (see Photos 179 and 181) and some cracking in the bottom of the plank can also be seen (Photo 183).

The connection between the precast concrete beams and concrete columns has exhibited a large amount of distress in a number of locations. As a result, grout filled steel columns were added, as seen in Photos 160 through 162 and Photos 174 and 175. While this was a great idea to support the beams, a hole was cut in the top of the column for pouring or pumping in the grout. Not only does the grout not completely fill the pipe, the steel pipe section is greatly reduced at the location of the hole, decreasing the ability of the column to carry loads.

As seen in Photos 153 and 154, there is a "pool" of water below the pool structure. A sump pump should be installed to remove the water from this area. Due to the presence of this water, access to portions of the pool structure for observation were limited.

There is an electrical safety concern in this space. There is electrical wiring run within the area below the pool deck structure. This wiring is not run in any conduit, the lighting is attached and wrapped with electrical tape, and the wiring is held to the column with a nail. These conditions clearly do not comply with any current safety codes.

3. Wading Pool

The Wading Pool is shown in Photo 9. It does not appear on the original drawings. When walking around on the deck surface surrounding the wading pool, the concrete appears to be very uneven. Photo 172 shows the general location of the wading pool with respect to the limits of the structurally supported main pool deck. Photo 164 shows a brick finished wall surface that was probably the original exterior wall. There is also soil and stone aggregate in the far corner of the photo. These materials are located just below the concrete slab of the wading pool deck. The photo also shows the plastic vapor retarder that was placed directly below the concrete slab. These are all signs of a concrete slab-on-grade, not a structural concrete slab. Photos 164 and 166 show some wood posts that were at one time most likely used to "prop" the slab. Since that time, the timbers have rotted and several have fallen down. Photo 167 shows another view of the bottom of the concrete slab with the plastic. More timbers and some plumbing lines are shown in Photo 168.

At the right side of the opening shown in Photo 9 is what appears to be a section of precast block or plank. This is shown in Photo 169. It is used to retain the earth to the right of the opening. Photo 170 was taken looking up toward the top of this "retaining wall". It should be noted that the wall is cracked and significant movement has already occurred. Other conditions below the wading pool are shown in Photos 163 through 171.

4. Maintenance Room and Maintenance Bays

Photo 87 shows the entrance doors in the Maintenance or Equipment Room. There is rust on the door, evidence of what can be found on the inside of the room. Photos 63 through 86 show the conditions inside the Maintenance Room. There is a chlorine tank in this room with little to no ventilation of the space. This leads to a very corrosive and potentially unsafe environment. The building code requires ventilation in such a situation. The metal tank shown in Photos 72 and 86 has not been used for a number of years. It should be removed from the building.

The condition of the structural steel beams supporting the precast concrete plank can be seen in Photo 63 through 78 and Photo 83 through 86. It appears that there is a significant amount of moisture coming through the floor above (shower, locker, and toilet rooms above) based on the number of cave-like formations that are present. There is severe de-lamination of the flanges of the beams. The moisture coming through the floor system and the corrosive chloride environment will only lead to continued degradation of this portion of the structure.

There are electrical safety concerns in this room, also. There are wires running exposed (not in conduit) and rusted junction boxes. This can be seen in Photos 67, 68, 71, 74, and 76. The wiring should be investigated and modified as necessary to bring it into compliance with current Building Codes.

The moisture that is present in the block wall shown in Photo 79 is a result of the soil that is below the wading pool, located on the back side of this wall. Photos 80 through 82 show a cracked beam bearing location and evidence of moisture at the top and bottom of another concrete block wall.

At the other end of the building are garage bays, an area that is used to perform maintenance on grounds-keeping and golf course equipment. There is a large amount of mold and mildew present on the inside of the concrete block walls, as seen in Photos 89 through 91.

At the overhead garage door openings, the brick piers have cracked. Steel pipe columns have been installed to support the ends of the precast concrete beams, as seen in Photos 111 through 120.

5. Exterior Facade

The exterior façade of the Recreation Building can be seen in Photos 120 through 127. On closer observation, there is a severe water infiltration problem, seen throughout the photos and in particular, in Photos 94 through 110. From failed sealants to open joints (missing sealants) to cracked brick and mortar joints, to missing mortar in joints, there are numerous locations where moisture has an opportunity to enter the walls. It is such a problem that moss can be seen growing from cracks and joints (see Photos 101, 104, 110, and 115).

6. Exterior Sidewalks and Paving

The concrete paved areas around the exterior of the Recreation Building are shown in Figure 4. As seen in Photos 191 through 212, there are areas that have settled and cracked and are in need of repair. The settlement is great enough in some locations that it presents a tripping hazard and a potential liability to the State Park. Photo 203 shows a rather large crack in the concrete retaining wall.

B. Lodge Building

The Lodge Building houses overnight rental rooms, a restaurant, meeting rooms, and supporting facilities. It is a multi-level structure consisting of precast hollow core concrete plank, precast concrete beams, steel beams, a few tube steel columns and spread foundations. The observations made for this building were mainly limited to the cracks present in the brick piers at the building exterior. Additionally, as other areas of concern were observed, they were also noted and are addressed in this report.

Figures 5 through 8, located in Appendix B, show portions of the framing plans and indicate locations where photos were taken. There was an addition to the lodge that is not shown on the original drawings. The approximate area of the addition has been noted on the figures.

This section of the report is divided into 3 areas as follows:

1. Exterior Facade
2. Decks/Plazas
3. Mechanical Area/Service Drive

Each area will be discussed in reference to the conditions that were observed. The original drawings for the building structure were used for the analysis of the structural components.

1. Exterior Facade

Exterior views of the Lodge Building are seen in Photos L56 through L60. There are numerous cracks in the brick and precast concrete exterior of the Lodge Building. As seen in Photos L1, L2, L8 through L10, and L19 through L39 and others, a variety of sealants have been used in different locations to seal the cracks.

In other locations, the open joints and cracks have not been addressed at all. Freeze/thaw cycles are very detrimental to open joints and cracks, weakening the members over time. Each time water gets into an open joint and freezes, it expands. This expansion puts pressure on the surrounding surfaces. Masonry elements generally do not have sufficient strength to resist this pressure and additional cracking and movement occurs. The cracking that was observed is very similar to the cracking that was found on the façade of the Recreation Building.

The drainage pipe seen in Photos L3 and L4 appears to potentially be causing some erosion problems. The pipe stops at the face of the building and the water then runs down alongside the face of the building. There is an excessive amount of moisture at the building face and dirt and plant growth are evident up against the sill of the full-height windows (see Photo L5).

One additional area of concern is the concrete beam seen in Photos L38 and L39. The structural member is actually a steel beam encased in concrete. Photos L19 through L33 all detail the condition of the beam. There is visible deflection and rust staining present.

2. Decks/Plazas

There are two areas of concrete decks or plazas that exhibit some distress. The first is shown in Photos L11 through L13. The concrete slab appears to be severely scaled with areas where the exposed aggregate is missing. From this area, an upper deck or plaza area is reached via a run of stairs, seen in Photos L14 through L18. A variety of sealants have been used between the steps and the brick wall. Water is also standing against the wall indicating that the sidewalk area is not sloped properly.

The upper plaza area is seen in Photos L38, L40 and L41. This area has been repaired in the past and is still currently leaking (according to WVDNR State Parks Personnel). Only the exterior conditions were observed. Both deck or plaza areas consist of hollow core precast concrete plank with a cast-in-place concrete topping slab.

3. Mechanical Area/Service Drive

Photos L43 through L52 show the conditions present at the mechanical units and the service drive alongside the Lodge Building. The grating on top of the mechanical unit enclosure does not appear to be properly supported. The grating is not level and may also not be attached to any supporting structure. No handrail is present at the edge of the grating, clearly not in compliance with Building Code Safety Requirements. The railing around the area with steel diamond plate at the single man-door appears to be damaged. The support of the steel diamond plate should be investigated further also.

The service drive, seen in Photos L45 to L49 should have a railing or guard at the outside edge to deter vehicles and/or personnel from injury and damage. At the other side of the service drive, the concrete drive abuts the exterior face of the Lodge (see Photos L47 and L48). The sealants appear to have failed, allowing water to penetrate the joint between the slab and the wall.

III. STRUCTURAL ANALYSIS

A. Recreation Building

Actual calculations were not performed to determine that the Wading Pool exhibits an unsafe condition. It was constructed as a slab-on-grade structure, designed to have continuous support from the subgrade. The Wading Pool has been closed and will not reopen unless repairs are made.

The structural steel beams at the ceiling of the Maintenance Room were analyzed since they are so severely deteriorated. To perform the structural analysis, a live load of 50 psf was used, in accordance with the loads prescribed by the International Building Code (2000). These beams were found to be adequate per the original design requirements, but potentially overstressed in their deteriorated condition. These beams will need to be replaced.

A simplified analysis of the brick piers was performed in an attempt to determine the cause of the cracking that was seen. A live load of 100 psf from the pool deck level was utilized for the analysis. The loads were such that they did not appear to be the cause of the cracking. Thermal differences between the members and freeze/thaw cycles and water infiltration problems appear to be the concern.

B. Lodge Building

The deflected and rusted concrete encased structural steel beam on the back side of the Lodge was evaluated. A roof live load of 30 psf and a floor live load of 125 psf (storage)

were used for the analysis. The calculations indicate that the structural steel beam in overstresses and requires temporary shoring immediately, especially prior to any snow loads being applied to the roof. The temporary shoring can consist of wood framing or a new steel pipe or tube column at the middle of the beam span. The column condition will require a spread footing. In both cases, the support must be carried through the hollow core precast plank, down to the level below so that loads are not transferred to the structural element directly below. Sketches of these methods are located in Appendix D.

IV. RECOMMENDATIONS FOR REPAIRS

This part of the report is divided into 2 major sections, each with 3 subsections as follows:

1. Emergency Repairs (Repairs to be Completed in the Near Future)
2. Short Term Repairs
3. Long Term Repairs

A list of recommendations for repairs to the structure for each area will be given in reference to the conditions that were observed. The Estimate of Probable Construction Costs for each type of repair is located in Appendix C for the Recreation Building and Appendix D for the Lodge Building. Plans showing approximate repair locations and supplemental details are also located in the same appendices.

A. Recreation Building

1. Emergency Repairs (Repairs to be Completed in the Near Future)

- Close Wading Pool or Repair to Slab-on-Grade Condition
- Provide ventilation to Maintenance Room
- Stop water migration from above into Maintenance Room
- Remove old steel tank
- Install sealants or coating to stop water infiltration through precast concrete deck
- Install lighting in accordance with current codes under pool and in Maintenance Room
- Install ventilation to shower/locker rooms
- Replace steel/grout filled pipes at pool columns with new galvanized steel columns

2. Short Term Repairs

- Replace steel beams at ceiling of Maintenance Room
- Repair cracked concrete and railing
- Remove existing coatings/coverings at pool deck and apply new waterproof coating system
- Install sealants at all open joint locations to prevent additional water infiltration at perimeter of building
- Epoxy inject cracks in pool and install new coating to top side
- Epoxy inject cracks and check for drainage behind retaining wall
- Coat exposed reinforcing steel with rust inhibitor and apply cementitious coating to areas

- Install sump pump and piping to remove water from below the pool structure

3. Long Term Repairs
- Repair/replace cracked and settled areas of concrete paving around exterior of building
- Replace damaged brick, repoint and install new sealants

B. Lodge Building

1. Emergency Repairs (Repairs to be Completed in the Near Future)
- Install temporary shoring at distressed beam near read of Lodge

2. Short Term Repairs
- Install sealants everywhere there are open joints to prevent additional water infiltration
- Install pipe columns at ends of precast beams (similar that what was done at Maintenance Bays at Recreation Building)
- Install railing per code at Mechanical Area
- Install proper steel structure consisting of steel beams and angles to support metal grating at Mechanical Area
- Repair/replace concrete topping and apply new waterproof coating system at scaled/deteriorated concrete toppings at plaza/deck areas
- Extend drainage pipe beyond face of building and create drainage swale for water runoff from pipe

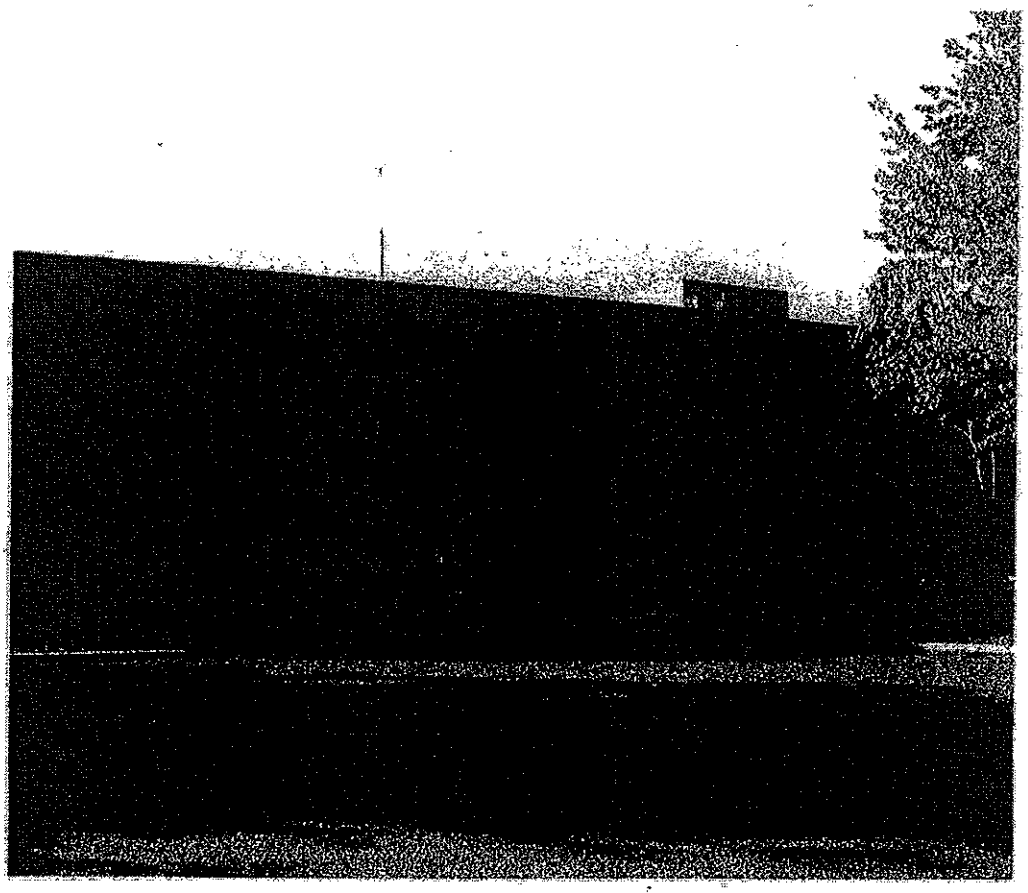
3. Long Term Repairs
- Replace structural steel beam with concrete encasement (New W18x97)
- Replace damaged brick, repoint and install new sealants at cracked brick piers and at perimeter of building to alleviate water infiltration

ANY ADDITIONAL CONDITIONS THAT ARE DISCOVERED DURING CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER IMMEDIATELY. DEVIATIONS FROM THESE RECOMMENDATIONS ARE NOT SUGGESTED, AND SHALL BE APPROVED PRIOR TO PERFORMING SUCH WORK.

Report Prepared by: Carol A Stevens

Carol A. Stevens, P.E.
CAS Structural Engineering, Inc.
June 2004

Structural Observation Report
Hawks Nest State Park Lodge
Ansted, West Virginia
April 2009



CAS Structural Engineering, Inc.
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INTRODUCTION

We performed a visual structural investigation and observations of several locations of the Hawks Nest Lodge, located in Ansted, West Virginia, during several time periods in late 2008. The building was constructed in the late 1960's and utilizes precast concrete hollow core concrete planks at the floors and roof, with these members bearing on masonry (brick and/or block) walls and pilasters or precast concrete beams. There are beams around the entire building perimeter at the floor levels and the roof. The building structure varies in height from 2-stories to 4-stories.

Several probes were performed to determine the connection and bearing conditions at the precast concrete beam and brick locations. These observations were made of the exterior facade elements and roof in order to determine the extent of the repairs that are required. Views of the building exterior are seen in Photos 1 through 5 located in Appendix A at the end of this report.

The purpose of this report is to document our observations and make recommendations for repairs. Each specific repair area is addressed. Photographs are located in Appendix A, repair figures and details in Appendix B, and a Preliminary Opinion of Probable Construction Costs is located in Appendix C.

OBSERVATIONS

Roof

The original composition roof system was replaced with the existing roof consisting of an EPDM rubber membrane with ballast as seen in Photos 6 and 7. The rubber membrane has been terminated on the top of the precast concrete spandrel beam, as seen in Photos 8 through 12. In many locations, the sealant is deteriorated and failing. This is a likely location for moisture to gain access to the structure. The lead cap that was placed on the top of the butt joints in the precast beams was left in place when the rubber roof was installed (see Photo 10).

There are also many locations where the roof has been repaired and patched. While there are a few expansion joints in the roof system, the locations should be evaluated and possibly modified when the roof is replaced.

There are a number of skylights that are intended to be operable to provide ventilation. It is understood that the majority of the units do not function or do not function as intended.

Spandrel Beams

The spandrel beams at the roof are in some cases load bearing (supporting roof plank ends) and in other cases, they are edge beams spanning in the same direction as the roof plank. There are no allowances for movement at any of the joints in the precast beams. Freeze/thaw and differential thermal movements cause the spandrel beams to move.

When the hard mortared butt joints crack, water enters the joint and freezes in cold temperatures, forcing the beams to shift. This results in continued degredation of the joint and even enough movement in the beams to "push" or "bow" the beams out of plane. This "bowing" can be seen in Photo 13. Deteriorated, open butt joints between precast beams are shown in Photos 14 through 18.

One probe was completed at the beam bearing location shown in Photo 18 (on the South Elevation at the roof above the restaurant– Column K6). Several bricks and mortar joint material were removed to determine what type of connection hardware was used between the members. Observed conditions from the probe are seen in Photos 19 through 23 and indicate that there was a steel shim plate under one end of one precast beam, but not the other. The inner wythe of the wall is separated from the face brick by rigid foam insulation. No ties between the wythes were visible at this probe location. Also, no connection was found either between the precast beams or between the beams and the brick. It should be noted that the roofing was not disturbed to determine if there was a connection between the precast beams and hollow core plank or the hollow core plank and the masonry walls. Photo 24 shows movement between the precast concrete beam and the face brick. ***It appears that the beam is "walking out" away from the brick face.*** This may be an indication that there are few if any anchoring devices between the components and that the structure in depending on the mortar joints for integrity. Additional minor deterioration can be seen in Photos 25 through 28. This type of brick cracking and movement is typical around the building.

The precast beam at the breezeway to the tram has a large spall, exposing some of the reinforcing steel at the bottom. This can be seen in Photos 29 and 30. ***Without appropriate repairs, the reinforcing steel in this beam will deteriorate and the beam's capacity will be greatly reduced.*** There are also a few spandrel beams where the concrete cover over the reinforcing steel was such that the stirrup bars are exposed. Repairs to the concrete cover should be made to prevent additional rusting of the steel reinforcing.

Pilasters

At the lower level near the pool, there are a number of small brick pilasters that are exhibiting distress. The pilasters are approximately 12" x 24" and are supporting floor and roof loads in addition to brick and block wall loads (refer to Photos 31 and 32). The pilasters have a number of cracks and the drawings did not indicate whether any structural steel was included within the pilaster. A probe was performed at one pilaster location to determine if supplemental steel or bearing plates were included when the building was constructed. Several bricks were removed during the probe, and as seen in Photos 33 and 34, no internal steel columns or plates were found. The precast concrete beams are bearing directly on the brick pilaster.

A severely deteriorated brick pilaster adjacent to the pool is shown in Photos 35 and 36. A temporary steel pipe column was installed at this location. Photos 37 and 38 show precast concrete beams bearing on masonry walls on the South Elevation. At this

location, the structure is 4-stories in height. The walls consist of 8" concrete block with 4" brick on the exterior exposed sides (when the wall is interior to the building it is only 8" thick). There is minor cracking at these locations.

Stair Tower #4

Stair Tower #4 shows signs of extreme distress. The walls of the stair are constructed of 8" concrete masonry units (CMU), with a brick face added to the exterior wall. The three interior walls are braced at each floor level, whereas the exterior wall spans from the lowest level to the roof (total of 4 floors). At each floor level and the roof, there is a precast concrete beam that bears on the block and brick wall at the exterior wall location. The precast concrete beam appears to bear directly on the brick veneer. No columns or reinforcing were found on the original structural drawings. An 8" CMU wall can safely span 12 feet horizontally or vertically. The minimum unsupported length of the stair wall is 13 feet, spanning horizontally. The existing condition of the exterior wall is shown in Photo 39. Interior wall conditions are seen in Photos 40 through 42. At the location where the crack occurs in the exterior brick veneer, the precast concrete floor and roof plank changes direction. No expansion joint was provided at this location in the building. Thermal stresses and changes in building materials in opposing directions can cause movement in addition to the structural issues indicated above. ***Repairs to this area of the building are necessary in the very near future to provide structural support to the stair walls.***

Balconies and Other Exterior Conditions

Many of the balconies have open joints that allow water to enter the building, as seen in Photos 43 through 45. The railing post at one balcony, seen in Photo 46 shows deterioration at the base where it interfaces with the concrete slab. The steel lintel over the door to the maintenance area on the East Elevation is deteriorating and a number of cracks were found in the brick veneer adjacent to the door (see Photos 47 and 48). Several bricks were removed from this area of the wall to use in determining the strength of the brick for structural evaluation. The test results are located in the Appendix.

There are long expanses of brick wall without any control joints. Control joints are essential to the proper functioning of the masonry wall and provide a location for shrinkage of the mortar joints and thermal movements to occur. No weeps were seen in any of the brick walls. The sealants around the windows are failing in many locations, potentially allowing water and insects to infiltrate at these points.

There are a number of locations where the brick mortar joints are in need of being repointed. Cracked brick should be replaced.

RECOMMENDATIONS and REPAIR ESTIMATES

Repair details are located in Appendix B and a Preliminary Opinion of Probable Construction Costs is included in Appendix C.

Roof

The roof has been patched over the years and it is recommended that the current roof be replaced with either a new composition roof or an EPDM mechanically fastened or adhered roof system. As noted previously, expansion joints in the roof should be evaluated at that time. When the roofing work is done (unless it is considered an alternate during construction), new cap flashing should be installed to prevent water infiltration into the building from this location. Refer to the Roof Flashing Detail in Appendix B for additional information.

The skylights should be replaced with functioning vent controls to provide for proper ventilation. This work could be considered as an alternate during the construction.

Spandrel Beams

Due to the "walking" condition found at a number of the spandrel beams at the roof, it is recommended that the beams be attached to the roof plank as indicated in the Roof Flashing Detail. Angles attached to the back side of the spandrel beam and the precast plank at two (2) locations along the beam length will provide positive attachment of the components. Additionally, it is recommended that dowel connectors be placed at the butt joints between the spandrel beams at the roof level. These connectors will allow for movement to occur at this location, but will provide lateral and vertical restraint to the elements. Backer rod and sealant should be installed at all spandrel beam butt joints to allow for movement at this location. See the Spandrel Beam Connection Detail located in Appendix B.

Pilasters

Where concentrated loads are the greatest, steel cube columns should be introduced into the brick pilasters for additional support. Even though the brick is very strong, localized stresses where precast concrete beams bear on a relatively small area of brick are very high. The steel columns will provide support to the precast beams and relieve the stresses on the brick face of the pilaster. See the Steel Tube Column Detail and the elevation drawings in Appendix B for additional information.

Stair Tower #4

As noted previously, the location where the exterior distress is exhibited is the location where the precast concrete plank changes span direction. This is a natural location for a building expansion joint. None was provided in the original design or construction; therefore, a natural expansion joint has occurred. Refer to Stair Tower #4 Repair Detail in Appendix B for details for reinforcing the block walls and providing for future movement at this location.

Balconies and Other Exterior Conditions

The existing lead cap should be removed along the front of the balcony and the joints at three (3) sides of each balcony should be cleaned and new backer rod and sealant placed. This will prevent water and insects from entering the structure at these locations. Any railing posts that are deteriorated to the point that they are structurally deficient should be repaired or replaced.

The deteriorated steel lintel over the double door on the lower East Elevation should be replaced and the brick repaired in this same location.

Control joints should be installed in the brick veneer as indicated on the elevation drawings located in Appendix B. Where applicable, weeps should also be installed to promote moisture migration out of the masonry walls.

As funding is available, the building should be cleaned to remove all soiling and microbial plant growth.

Repair Estimate

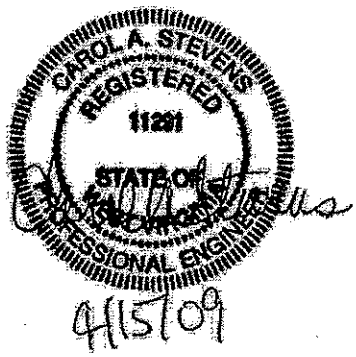
The Preliminary Opinion of Probable Construction Costs is located in Appendix C. The base bid items total approximately $327,000 and alternates comprise an additional $294,000.

THESE RECOMMENDATIONS SHOULD BE REVIEWED PRIOR TO PREPARATION OF CONSTRUCTION DOCUMENTS FOR REPAIR ACTIVITIES. ANY ADDITIONAL CONDITIONS THAT ARE DISCOVERED DURING CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER IMMEDIATELY.

Report Prepared by: Carol A. Stevens

Carol A. Stevens, P.E.
CAS Structural Engineering, Inc.

April 2009



4/15/09

I. INTRODUCTION AND GENERAL DESCRIPTION OF STRUCTURE

We performed a visual structural survey of the existing conditions of the structure at the Pipestem Resort State Park Recreation Building. The building was designed in 1967 and constructed shortly thereafter. The lower level consists of a concrete slab-on-grade and the upper level consists of precast concrete planks and beams, structural steel beams and concrete columns. The main swimming pool is constructed of conventional reinforced concrete retaining walls and slab-on-grade. The wading pool is constructed of concrete on metal deck supported by structural steel beams.

There have been a number of leaks over the years and temporary pipe column supports have been added in many location. The purpose of this report is to document the existing conditions of the structure and provide short-term and long-term recommendations for repair and associated probable construction costs. Due to the top surface of the pool deck being covered with carpet, the observations were all made from the bottom side of the structure. The Survey Observations and Existing Condition are contained in Section II of the report, followed by the Structural Analysis in Section III and Recommendations for Repairs in Section IV. Photographs taken are located in Appendix A as are plans indicating conditions and photo locations. The Repair Plans and Probable Construction Costs are located in Appendix B.

II. SURVEY AND EXISTING CONDITIONS

Sketch 1, located in Appendix A shows the Overall Framing Plan of the area that was surveyed. This area is enlarged in Sketches 2 through 5 in order to show detail of locations where photographs were taken.

This section of the report is divided into 3 areas as follows:

A. Precast concrete plank and precast concrete beams
B. Structural steel beams and metal deck at wading pool
C. Structural steel beams along concrete block corridor wall

Each area will be discussed in reference to the conditions that were observed on the day of the survey. The original design drawings for this building were used for the analysis of the structural components.

A. Precast Concrete Plank and Precast Concrete Beams

There are a number of locations where water has calcium has effloresced through the precast concrete planks. Additionally, the water penetration that caused the efflorescence is most likely fairly high in chloride content (due to the swimming pool chemicals) and would have a detrimental effect on the reinforcing steel in the concrete planks. There is evidence of cracking and spalling of the precast concrete (see Photos 1 through 15) and there are even areas where portions of the bottom face of the hollow plank are missing (see Photos 43 through 55).

As seen in Photo 37, there is a minor amount of cracking that has occurred in the precast concrete beams.

ANY ADDITIONAL CONDITIONS THAT ARE DISCOVERED DURING CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER IMMEDIATELY. DEVIATIONS FROM THESE RECOMMENDATIONS ARE NOT SUGGESTED, AND SHALL BE APPROVED PRIOR TO PERFORMING SUCH WORK.

Report Prepared by: _____

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June 5, 2002