



## PEAK INNOVATION CENTER Roof & Site Drainage Improvements

**Phase 1**  
**Warehouse Overflow Drains**  
Punched & Substantially  
Complete as of 11.7.2025

**Phase 2**  
**Site Drainage Improvements**  
Punched & Substantially  
Complete as of 11.7.2025

**Phase 3**  
**Main Building Overflow Drains**  
GMP with District for Approval to  
Proceed

**Phase 4**  
**North, East and South Site  
Drainage Improvements**  
Design Team Contracts with  
District for Approval



# PEAK INNOVATION CENTER

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### Phase 1

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### Phase 2

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PEAK INNOVATION CENTER

Roof & Site Drainage

Improvements

Phase 3

Main Building Overflow Drains

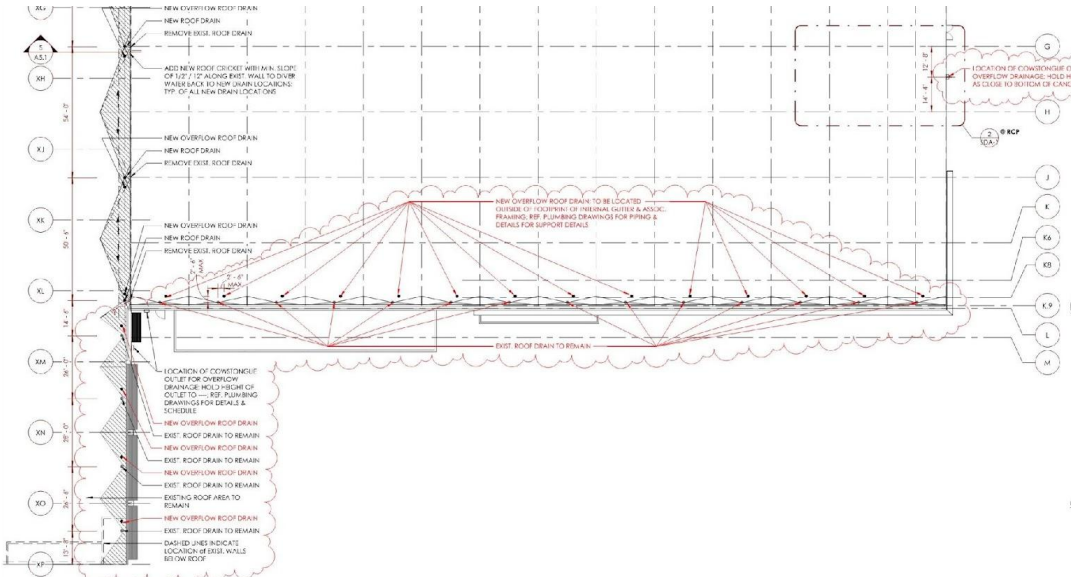
GMP with District for Approval to Proceed



Envista’s evaluation of the 14 roof drains on the main roof, the four roof drains on the canopy, and their vertical conductors and horizontal branches were sized as required for the roof area covered and the flow rates required for each roof drain. Therefore, Envista concluded that *the roof drainage for the south facet of the East Wing was sized in general accordance with the requirements of the NSPC.*

Envista reviewed the secondary roof drain requirements in the IPC, Section 1108, Secondary (Emergency) Roof Drains, which revealed the following:

- 1108.1 Secondary (emergency overflow) drains or scuppers.**
- Where roof drains are required, secondary (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Where primary and secondary roof drains are manufactured as a single assembly, the inlet and outlet for each drain shall be independent.
- 1108.2 Separate systems required.**
- Secondary roof drains systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location which would normally be observed by the building occupants or maintenance personnel.
- 1108.3 Sizing of secondary drains.**
- Secondary (emergency) roof drain systems shall be sized in accordance with Section 1106 based on the rainfall rate for which the primary system is sized in Tables 1106.2, 1106.3 and 1106.6. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.





# PEAK Innovation Center

## Drainage Infrastructure Analysis & Improvements "Phase 4" Work Scope

Presented to Fort Smith Public Schools Board

**Nick Griffin, PE**

November 17, 2025

## 1. Project Site

Site location and drainage area

## 2. Background

Brief history of analysis & observations, 2021-2025

## 3. Recommended Solution

Comprehensive analysis and drainage improvement construction

## 4. Next Steps

Scope of work and authorization request





## PEAK Innovation Center

Location: Northwest corner of Zero Street and Painter Lane, Fort Smith, Arkansas

Site Area: Approximately 14 acres

Building: Approximately 173,000 SF existing structure

Watershed: Massard Creek drainage basin





**PEAK Innovation Center Drainage Basin:** 160 acres, split between FSM & Barling





## The Challenge

PEAK Innovation Center faces significant drainage infrastructure challenges including future flooding risk to the building, poor construction quality, undersized systems, and ongoing erosion and structural failures.

**Critical Note:** Building finished floor elevation is at or near anticipated flood elevations based on FEMA data

## The Solution

Comprehensive engineering analysis is required to properly size infrastructure, verify flood protection, evaluate emergency flood routing conditions, and prepare complete construction documents to bid drainage improvements.

## The Investment

\$204,313 is needed to complete engineering analysis and design.

Additional funding on the order of \$2-5M will be needed to complete drainage improvements construction.



## Pre-2021 Conditions

- Existing warehouse building
- Paved and gravel parking
- Existing drainage infrastructure

## 2021 Renovation Project

Conversion from warehouse to PEAK Innovation Center school

- Parking & driveway modifications
- Net increase in impervious area
- Some drainage modifications

## June 2023 - Halff Associates Drainage Report

- FSPS engaged Halff Associates for planning
- Proposed parking lot additions and drainage improvements
- Design included two above-ground detention ponds
- New storm drains, inlets, and underground piping systems
- Phased implementation approach
- Onsite Post-development flows designed to be less than pre-development

**Key Design Features:** Storm Drains A & B with box culverts; System designed for 25-year storm



**Q4 2023:** FSPS engaged Mickle Griffin to conduct independent review of existing drainage report and plans

## **Critical Findings**

**Tailwater Assumptions:** Downstream conditions critical to design; ArDOT future box culvert not hydraulically analyzed; top of culvert approximately same elevation as building floor

FEMA Data: 100-yr flood elevations several feet above building floor elevation

Emergency Routing: No analysis of emergency flood relief; relief points 6-12 inches below floor

## **MG Recommendations Before Construction**

1. Hydraulic analysis to verify 100-yr flood elevations downstream
2. Analysis of ArDOT box culvert using verified tailwater conditions
3. Reevaluation of PEAK drainage improvements based on updated analysis
4. Analysis of emergency flood relief during extreme event or drainage failure

**General Conclusion:** Utilized standard practices, but additional due diligence is needed to prevent potential building flooding during extreme storm or emergency conditions



**2024-2025:** Construction activities commenced on roof drain and site drainage improvements

## July-August 2025 - Construction Quality Issues Discovered

Contractor observations prompted MG site inspection

### MG Visual Inspection Findings (August 6, 2025):

- **Severe erosion** throughout main drainage channel
- **Poor construction quality** - well below industry standards
- **Obstructed flow paths** from debris and sediment buildup
- **Undersized piping** - larger pipes discharging into smaller pipes
- **Structural failures** - sinkholes and settlement near structures
- **Water intrusion** causing pavement sink holes

### Poor Workmanship:

- Inadequate joint sealing,
- poor subgrade preparation,
- form work left in place,
- concrete spilled in flowlines

### Resulting Failures:

- Extensive water intrusion,
- structural undermining,
- broken concrete sections,
- differential settlement

**MG Conclusion:** Construction quality so poor that rehabilitation is not viable - complete removal and replacement recommended

## Building Flood Risk

**The PEAK Innovation Center building remains at risk of flooding due to:**

1. Insufficient downstream analysis - Tailwater conditions need to be verified
2. FEMA BFE data - Indicates flood elevations above building floor
3. Undersized drainage system - Infrastructure appears inadequate for design flows
4. Poor construction quality - Increased likelihood of failure or blockage
5. No emergency routing analysis - Unknown capacity during extreme event or failure

**Additional Concerns:** Ongoing erosion, structural failures, and settlement create safety hazards and maintenance challenges



## Comprehensive Engineering Approach

Complete engineering analysis and reconstruction to properly address flooding risks and infrastructure failures

### Phase 1: Analysis

- Comprehensive site survey
- Downstream hydraulic modeling
- ArDOT culvert analysis
- Emergency flood routing
- Infrastructure sizing verification

### Phase 2: Design

- Complete reconstruction plans
- Proper sizing for all components
- Erosion control measures
- Construction specifications
- Bid documents

**Key Benefit:** Proper engineering analysis and design will ensure long-term protection of the facility and eliminate ongoing maintenance issues

### **Task 1: Northeast Roof Drain Outfall (\$19,072)**

Design and prepare construction documents for Phase 3 roof drain improvements

### **Task 2: Site Drainage Analysis (\$87,813)**

- Analysis of drainage on north and east side including offsite run-on
- Detention basin analysis to attenuate flooding potential
- Emergency flood routing analysis to mitigate building flooding risk

### **Task 3: Construction Documents (\$90,864)**

- 30/60/90 plan development and necessary permits
- Final construction plans, specifications, and bid documents

### **Task 4: Infrastructure Failure Analysis (\$6,564)**

Inspect and analyze existing pipe/joint/structure connections with recommendations

**Analysis & Design, Total Fee:**

**\$204,313**



## Protecting Your Investment

- PEAK represents significant facility investment for FSPS
- Building flood risk threatens facility and educational operations
- Proper engineering now prevents catastrophic failure later

## Safety & Liability

- Student and staff safety is paramount
- Known flooding risks create liability exposure
- Proactive mitigation demonstrates responsible stewardship

## Long-Term Value

- Eliminates ongoing erosion and structural failure issues
- Reduces future maintenance costs
- Ensures reliable drainage infrastructure for decades to come

## Proposed Project Schedule

1

### **Board Authorization**

Approval to proceed with engineering analysis and design

2

### **Kickoff Meeting with FSPS and MAHG**

Establish schedule, communication protocols, and deliverables

3

### **Begin Field Data Collection**

Survey, subsurface investigations, infrastructure inspection

4

### **Coordinate with City and ArDOT**

Gather downstream data and ArDOT culvert information

**Target Completion:** Engineering analysis report and preliminary recommendations within 60 days of authorization



## Consequences of Inaction

**Building Flood Risk Continues:** Without proper analysis and reconstruction, the building remains vulnerable to flooding

**Infrastructure Degradation:** Poor construction quality and erosion will worsen over time

**Increased Costs:** Deferred maintenance and emergency repairs are always more expensive

**Operational Disruption:** Flooding event could force facility closure

**Safety Concerns:** Ongoing erosion and structural failures present hazards

**Proactive investment now provides long-term protection and peace of mind**

# Questions?

## Contact Information

### **Mickle Griffin Engineers and Surveyors**

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Fort Smith, Arkansas 72903

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**Nicholas J Griffin, PE - Vice President**

Thank you for your consideration of this critical project to ensure the safety and functionality of  
PEAK Innovation Center for Fort Smith students and staff.

## Local Expertise & Experience

- \* Fort Smith-based civil engineering firm with deep local knowledge
- \* Extensive experience with Fort Smith drainage requirements
- \* Established relationships with City of Fort Smith and ArDOT

## Proven Track Record

- \* Successfully completed peer review identifying critical issues
- \* Conducted thorough August 2025 inspection revealing deficiencies
- \* Commitment to protecting client interests and public safety

## Comprehensive Approach

- \* Thorough analysis considering all drainage performance factors
- \* Focus on long-term solutions, not quick fixes
- \* Clear communication and collaboration with all stakeholders