

Additional Cost Considerations for the
Nicholas County Board of Education

August 2, 2018

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Purpose:

The following document is a summary of costs associated with the additional scope of work developed beyond the base cost estimate validated by the United States Army Corps of Engineers (USACE) Center of Excellence. The additional scope consists of three parts:

- Codes and Standards associated with the replacement of Summersville Middle School in Summersville, WV (Nicolas County) if it was rebuilt on the same parcel footprint to comply with the local floodplain ordinance.
- Codes and Standards associated with the legal requirement to the new high school replacing the Richwood High school include a Career Technical Center.
- Additional mitigation measures associated with rebuilding the Summersville Middle School to make it more resilient to a similar hazard event.

Background:

As a result of the June 2016 flooding, FEMA Public Assistance determined that Summersville Middle School was eligible for replacement based on a comparison of repair versus replacement costs. According to 44 CFR §206.226(f), *a facility is eligible for replacement when the repair cost exceeds 50 percent of the replacement cost*. The comparison of repair costs with replacement costs results in a fraction that expresses repair as a percentage of replacement.

Due to the widespread damage of the 2016 flooding, in addition to Summersville Middle School, Richwood High School and Richwood Middle School were also substantially damaged. Due to both Richwood High and Richwood Middle Schools being located in the floodway, they were approved for directed relocation to move both schools outside of the floodplain.

As the School Building Authority (SBA), and their client the Nicholas County Board of Education (NCBOE), determined that the use of FEMA 428 funds to consolidate the three schools into two was the best option when looking at multiple factors moving forward with school reconstruction. Since June 2016, FEMA, the SBA and the NCBOE have worked together with contractors to develop the cost estimates for each school to develop the fixed cost for the 428 Agreement.

The following costs were developed and reviewed for consideration for inclusion in the 428 estimate beyond the base cost estimate referred to above validated by USACE.

Section 1: Cost Summary

The following document is a summary and explanation of costs associated with Summersville Middle School in Nicholas County, West Virginia. The cost identified in this document are in addition to the base estimate for relocating all three schools that was validated by the USACE:

Additional Costs for Summersville Middle School	
Codes and Standards to meet floodplain ordinance	\$4,772,089
Cost of Career Technical Center Facilities	\$20,865,677
406 Mitigation Measures for Summersville Middle	\$4,489,758
Total Costs for Additions	\$30,127,524

All of the costs referenced above have been escalated using 0.291% per month (3.5% per annum) for 24 months. Process used RSMMeans as the CEF.

Section 2: Codes and Standards – Floodplain Management

The Base Estimate validated by the USACE Center of Excellence for Summersville Middle School did not originally include the cost to elevate the new structure to Base Flood Elevation plus two feet as required in the Summersville Floodplain Management Ordinance.

The existing Summersville Middle School is located in the 100-year floodplain, specifically Zone A, as identified by the WV Flood Tool and the FEMA National Flood Hazard Layer Maps provided as Map 1.

The Base Flood Elevation (BFE) for the property where Summersville Middle School is located was determined to be 1,844' based on the high water mark established during the 2016 flooding and is considered best available data for floodplain management purposes. The original structure had a first floor elevation of 1,842' as determined by ZMM and is 2 feet below BFE. To comply with the Summersville Floodplain Management Ordinance, the structure would have to be elevated two feet above Base Flood Elevation to 1,846 feet.

To comply with the elevation requirements, the new structure will be constructed on select fill material so that the first floor elevation of the new structure will be at 1,846 feet.

The cost for Codes and Standards totals \$4,453,837 and detailed in Table 1.



Figure 1 Summersville Middle School

Map 1 – Flood Map – Summersville Middle School

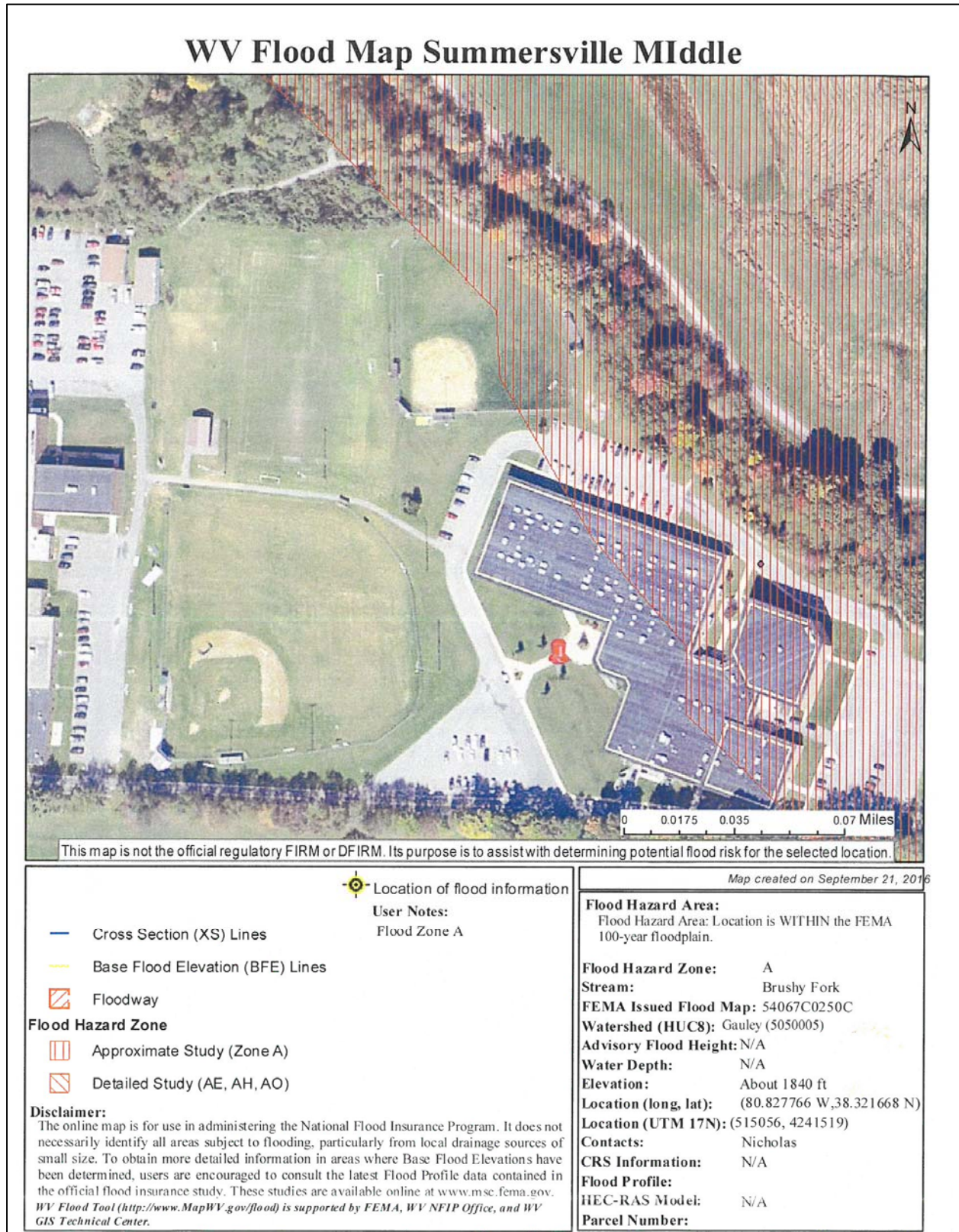


Table 1 – Codes and Standards – Floodplain Management

Summersville Middle School - Codes and Standards (Cost to Raise Footprint to BFE+2') *All Items Listed Below Were not Included in the Validated CEF								
		Allowance B-H	Quantity	Units	Unit Price	City Adjustment Factor	RS Means Cost Estimate	Comments
Part A								
	Earthwork (Borrow Material 5 miles, Compaction)			S.F.	No quantity here	1	\$2,130,883	Based on Q2, 2017, Closest location Beckley, WV
	Utilities Extensions		39,494.4	S.F.	No quantity	1	\$17,617	
			Total Part A Base Construction Cost				\$2,148,500	
Part B								
B.1	Safety Security (4 - 6%)	4.00%					\$85,940	
	Temp Services and Utilities (0 - 1%)	1.00%					\$21,485	
	Quality Control (0 - 1%)	1.00%					\$21,485	
	Submittals (0 - 5%)	5.00%					\$107,425	
B.2	General Conditions (4.25%)	4.25%					\$91,311	
			Total Part B Gen Requirement/Conditions				\$327,646	
			Total Part A & B				\$2,476,146	
Part C								
C.1	Prelim. Engineering Analyses (7 - 20%)	10.00%					\$247,615	
	Working Drawing (2 - 10%)	5.00%					\$123,807	
C.2	Facility or Project Type and Complexity	2.00%					\$49,523	
C.3	Access Contingency (0 - 4%)	2.50%					\$61,904	

	Storage Contingency (0 - 4%)	2.50%					\$61,904	
	Staging Contingency (0 - 4%)	2.50%					\$61,904	
C.4	Economies of Scale (over \$10 millions)	0.00%					\$0	
			Total Part C Construction Cost Contingency				\$606,656	
			Total Part A through C				\$3,082,801	
Part D								
D.1	GC's Home Office Overhead	7.70%					\$237,376	
D.2	GC's Insurance, Payment, Performance Bond	3.30%					\$101,732	
D.3	GC's Profit - New Construction 3%	3.00%					\$102,657	
			Total Part C Construction Cost Contingency				\$441,765	
			Total Part A through D				\$3,524,567	
Part E								
	Cost Escalation Factor							
	Months	24						
	Monthly Factor	0.291%					\$246,156	
			Total Part A through E				\$3,770,723	
Part F								
F.1	State, Local & Federal Review				1,000.00		\$1,000	State plan review fee
F.2	Construction Permits				1,500.00		\$1,500	NPDES, temp. power, etc.
			Total Part F Plan Review Fees				\$2,500	
			Total Part A through F				\$3,773,223	
Part G								
	Applicant's Reserve for Change Order (3 - 7%)	3.00%					\$113,197	
			Total Part A through G				\$3,886,419	

Part H								
H.1	Applicant Project Management - Design Phase	1.00%					\$38,864	
H.2	A/E Design Contract Costs (5.6 - 7.6%)	7.60%					\$295,368	
	A/E Inspection, 3%	3.00%					\$116,593	
H.3	Applicant Project Management - Constr. Phase	3.00%					\$116,593	
			Total Applicant PM and Design Review Cost				\$567,417	
			Total Part A through H				\$4,453,837	
TOTAL FOR ADDITIONAL CODES AND STANDARDS							\$4,453,837	

With escalation, the total is \$4,772,089.

Section 3: Codes and Standards – State Board of Education

Certain Codes and Standards applicable to West Virginia were not included in the original estimate. During the course of mediation, a legal opinion was developed that required adding a Career Technical Education facility as part of the comprehensive high school. Two firms hired by the Applicant’s client, performed a review and provided acceptable justification for the following:

In accordance with West Virginia Policy 6200 Career Technical Education (CTE) Guidance Document (Tabs 4 and 5) Nicholas County Board of Education requests a CTR facility to support nine (9) programs with a facility size of 39,640 square feet. The required specifications are included in Appendix A.

The estimated cost of the facility is \$16,570,872.79, with an additional escalation costs at 3% per annum for 24 months of \$1,009,166.15.

In addition to the construction and escalation costs, additional costs estimated include:

Plan Review and Permit Fees	\$106,480.23
Reserve for Change Orders (3%)	\$527,401.17
Project Management Design Phase (1%)	\$174,800.39
A/E Design Contract (7.6%)	\$1,384,181.95
Basic Construction Inspection Services (3%)	\$546,388.61
Project Management Construction Phase (3%)	\$546,388.61
	\$3,285,638.96

Section 4: 406 Mitigation Measures

As the survivors in West Virginia continue the recovery process, FEMA staff have been working diligently with the West Virginia Division of Homeland Security and Emergency Management, West Virginia School Building Authority, and Nicholas County Schools to replace three substantially damaged schools from the 2016 flood event. The three schools had a student population of approximately 1,180.

Two of the three schools were located in a floodway with directed relocation authorized by the FEMA Region III Regional Administrator. Summersville Middle School, located in the floodplain, was substantially damaged and was approved for replacement rather than directed relocation.

In an effort to maximize potential options, Nicholas County Schools are focusing on the benefits of utilizing the Alternative Procedures Pilot Program for Permanent Work (428) to rebuild in a manner most beneficial to the students and the community at large. FEMA and State partners are resolute in ensuring the students and communities of the affected schools receive maximum protection through mitigation along with maximum eligible reimbursements.

In order to resolve various local and state issues, the Governor sponsored a mediation process between the county and State school boards, resulting in the agreement to build two schools; a community school in the vicinity of the Town of Richwood, and a comprehensive school in the center of the county.

Under 428, the Applicant will not replace Summersville Middle School, but will combine three schools into two schools under a capped consolidated sub-grant project.

Various 406 Mitigation opportunities have been identified for Summersville Middle School such as Access Road Elevation, Bank Stabilization, Stream Gauges and Monitors, and Emergency Safe Rooms. The proposed measures are outlined on page 3 with each reducing the potential of future similar damage to the facility. BCA's will be completed on each measure to determine viability for inclusion in the project.

As per the PAPPG, January 2016, page 95, generally, eligible mitigation measures are those the Applicant performs on the damaged portion(s) of the facility. If the Applicant proposes mitigation measures that are distinct and separate from the damaged portion(s) of the facility, FEMA evaluates the proposal and determines eligibility on a case-by-case basis considering how the mitigation measure protects the damaged portion(s) of the facility and whether the mitigation measure is reasonable based on the extent of damage

In order to maximize the mitigation effort, FEMA recommends the retention of the 406 Mitigation funds by including said funds in the capped consolidated sub-award under the Alternative Procedures Pilot Program for Permanent Work.

If the capped amount for an Alternative Procedures Project includes mitigation funds, FEMA may allow the Applicant to retain the mitigation funds on a case-by-case basis. The level of risk reduction achieved for the Alternative Procedures Project must equal, or exceed, the benefit that the Applicant would have achieved through completion of the approved mitigation measures. (Source: Page 108, PAPPG, January 2016)

The Applicant has identified-resiliency measures being taken at the new facility and to demonstrate the level of risk reduction in the scope of work for the capped consolidated sub-award. See Resiliency Measures

The 406 mitigation measures identified are:

- 1) Access Road Elevation
- 2) Bank Stabilization of Brushy Fork Creek
- 3) Stream Gauges and Monitors, and
- 4) Safe Rooms

Each measure is described in detail in the following paragraphs, but a summary of these mitigation efforts:

Mitigation Measure	Cost Estimates	Benefit Cost Estimate
Access Road Elevation	\$2,337,425	
Bank Stabilization of Brushy Fork Creek	\$485,838	
Stream Gauges and Monitors	\$50,868	
Safe Rooms	\$1,343,204	
	\$4,217,335	1.98

With escalation, the total is \$4,489,758.

- 1) Access Road Elevation –

Elevate portions of School Road and Grizzley Lane to allow unimpeded access during a flooding event. Currently, at the corner of Highway 19 (Mountaineer Expressway) and School Road, the elevation is approximately 1,866 feet and slopes to 1,838 feet. The Base Flood Elevation in this area is estimated at 1,844 feet. There is approximately 830 feet of School Road (where the road elevation dips below base flood elevation) that would need to be elevated from 1 to 6 feet to be accessible during a 100-year flood event.

Along Grizzley Lane, the parking lots and the roadway range in elevation from 1,836 to 1,840 feet in elevation. The parking areas and roadways would need to be elevated from 4 to 8 feet to be at the base flood elevation of 1,844 feet. This would require the elevation of approximately 1,337 feet of roadway plus parking areas.

Currently, the Base Flood Elevation is determined to be 1,844 feet based on the high water mark from this flooding event. Due to this being an unstudied area, an H&H study would be required to establish an official Base Flood Elevation.

An additional measure would be to replace all impermeable surfaces on the school campus with permeable pavement to address potential nuisance flooding.

Estimated Cost: \$2,337,425

2) Bank Stabilization of Brushy Fork Creek –

Based on a review of the site, high water and high velocity flow conditions over time have caused erosion and encroachment of Brushy Fork Creek to Summersville Middle School. Currently, the creek is encroaching to the south and continued erosion and encroachment exacerbates the potential for flooding as well as damage/failure of school infrastructure.



The recommended solution is to stabilize approximately 1,000 feet of the bank of Brushy Fork Creek that meanders closest to the school. Stabilization measures to be considered should include Longitudinal Peaked Stone Toe Protection (LPSTP), the establishment of suitable flood benches along the stream, or other standard bank stabilization methods.

Estimated Cost: \$485,838

Map 2 – Summersville Middle School Road Elevation

Summersville Middle School

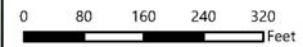
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1) Approximately 830 feet of School Road to be elevated to Base Flood Elevation

2) Approximately 1,549 feet of Grizzley Lane plus parking area to be elevated to Base Flood Elevation

3) Approximately 1,000 feet of stream bank to be stabilized.



Data Sources:

FEMA, ESRI;

Datum: WGS 1984
Projection: Mercator

3) Stream Gauges and Monitors –

Flood damage was the result of the creek flooding. River gages and perimeter cameras monitored remotely from a control center within the school to assess conditions should be a mitigation measure to alert occupants with fair warning to prepare and evacuate if necessary.

Estimated Cost: \$50,868

4) Safe Rooms –

Three (3) safe rooms (approximately 1,600 square feet) designed and constructed to accommodate all 774 students anticipated at Summersville Middle School. The safe rooms will be constructed roughly at the ends of the L-shaped original school structure. The safe rooms will provide refuge from 2-24 hours against flooding, fire, high velocity winds and potential active shooter incidents.

Each safe room will be elevated three feet above the existing first floor elevation and constructed with:

- 1) False partitions to subdivide for usable space with internal doors and knockout panels,
- 2) Reinforced concrete construction supported off concrete columns and spread footings,
- 3) Ramps and handicapped access for ADA Compliance,
- 4) In-fill walls made of high strength reinforced concrete masonry units grouted solid, and
- 5) One entrance/egress door that is bullet proof with a two-hour fire rating.

Each safe room will have:

- 1) A roof access ladder and entrance/egress point,
- 2) A dedicated HVAC and uninterrupted power supply,
- 3) Fire/Smoke alarms,
- 4) An attached bathroom and water filters,
- 5) A wall mounted first-aid kit and emergency bed, and
- 6) A dedicated hard-wired phone line and Wi-Fi modem/router for phone and internet access.

Estimated Cost: \$1,343,204

Tables 4-7 include detailed cost estimates for each of the four (4) 406 Mitigation Measures described above.

Table 3 – Access Road Elevation Cost Estimate

Summersville Middle School - Elevating School Roads and Parking to BFE							
	Allowance B-H	Quantity	Units	Unit Price	City Adjustment Factor	RS Means Cost Estimate	Comments
Part A							
Elevate perimeter roads and parking lots - Asphalt 4" thick		12,450.0	S.Y.	13.74	1	\$171,063	Based on Q2, 2017, Closest location Beckley, WV
Elevate perimeter roads and parking lots - base & sub-base		12,600.0	S.Y.	10.26	1	\$129,276	
Elevate perimeter roads and parking lots - subgrade select borrow fill		20,000.0	C.Y.	39.00	1	\$780,000	
Compaction Subgrade - 8" layers		20,000.0	C.Y.	2.17	1	\$43,400	
Storm drainage catch basin removal and installation		20.0	Ea.	260.22	1	\$5,204	
wheel stops, parking bumpers 6'x10"x6"		100.0	Ea.	111.10	1	\$11,110	
Vehicle guide rail along steep creek slope		700.0	L.F.	35.50	1	\$24,850	
		Total Part A Base Construction Cost				\$1,164,903	
Part B							
B.1	Safety Security (4 - 6%)	4.00%				\$46,596	
	Temp Services and Utilities (0 - 1%)	1.00%				\$11,649	
	Quality Control (0 - 1%)	1.00%				\$11,649	
	Submittals (0 - 5%)	5.00%				\$58,245	
B.2	General Conditions (4.25%)	4.25%				\$49,508	
		Total Part B Gen Requirement/Conditions				\$177,648	

Part C								
C.1	Prelim. Engineering Analyses (7 - 20%)	10.00%					\$134,255	
	Working Drawing (2 - 10%)	5.00%					\$67,128	
C.2	Facility or Project Type and Complexity	2.00%					\$26,851	
C.3	Access Contingency (0 - 4%)	2.50%					\$33,564	
	Storage Contingency (0 - 4%)	2.50%					\$33,564	
	Staging Contingency (0 - 4%)	2.50%					\$33,564	
C.4	Economies of Scale (over \$10 millions)	0.00%					\$0	
			Total Part C Construction Cost Contingency				\$328,925	
Part D								
D.1	GC's Home Office Overhead	7.70%					\$128,704	
D.2	GC's Insurance, Payment, Performance Bond	3.30%					\$55,159	
D.3	GC's Profit - New Construction 3%	3.00%					\$55,660	
			Total Part D Construction Cost Contingency				\$239,523	
Part E								
Cost Escalation Factor								
Months		12						
Monthly Factor		0.291%						
			Total Part E				\$66,732	

Part F								
F.1	State, Local & Federal Review				1,000.00		\$1,000	State plan review fee
F.2	Construction Permits				1,500.00		\$1,500	NPDES, temp. power, etc.
			Total Part F Plan Review Fees				\$2,500	
Part G								
	Applicant's Reserve for Change Order (3 - 7%)	3.00%					\$59,407	
			Total Part G				\$59,407	
Part H								
H.1	Applicant Project Management - Design Phase	1.00%					\$20,396	
H.2	A/E Design Contract Costs (5.6 - 7.6%)	7.60%					\$155,012	
	A/E Inspection, 3%	3.00%					\$61,189	
H.3	Applicant Project Management - Constr. Phase	3.00%					\$61,189	
			Total Part H Applicant PM & Design Review Cost				\$297,787	
			SUBTOTAL FOR A-H				\$2,337,425	
TOTAL FOR ROAD ELEVATION							\$2,337,425	

Table 4 – Bank Stabilization of Brushy Fork Creek

Summersville Middle School - Brushy Fork Creek Bank Stabilization									
		Allowance B-H	Quantity	Units	Unit Price	City Adjustment Factor	RS Means Cost Estimate	Comments	
Part A									
	Gravel/Stone Armor		1,600.0	LCYD	71.88	1	\$115,008	Based on Q2, 2017, Closest location Beckley, WV	
	Geotextile Fabric		20,000.0	SFT	3.56	1	\$71,200		
	Clearing of heavy brush		5.0	Acres	396.00	1	\$1,980		
	Storm Drain Manholes		5.0	Ea.	1920.00	1	\$9,600		
	Storm outfall structure		5.0	Ea.	5940.00	1	\$29,700		
			Total Part A Base Construction Cost					\$227,488	
Part B									
B.1	Safety Security (4 - 6%)	4.00%					\$9,100		
	Temp Services and Utilities (0 - 1%)	1.00%					\$2,275		
	Quality Control (0 - 1%)	1.00%					\$2,275		
	Submittals (0 - 5%)	5.00%					\$11,374		
B.2	General Conditions (4.25%)	4.25%					\$9,668		
			Total Part B Gen Requirement/Conditions					\$34,692	
			Total Part A & B					\$262,180	

Part C								
C.1	Prelim. Engineering Analyses (7 - 20%)	10.00%					\$26,218	
	Working Drawing (2 - 10%)	5.00%					\$13,109	
C.2	Facility or Project Type and Complexity	2.00%					\$5,244	
C.3	Access Contingency (0 - 4%)	2.50%					\$6,554	
	Storage Contingency (0 - 4%)	2.50%					\$6,554	
	Staging Contingency (0 - 4%)	2.50%					\$6,554	
C.4	Economies of Scale (over \$10 millions)	0.00%					\$0	
			Total Part C Construction Cost Contingency				\$64,234	
			Total Part A through C				\$326,414	
Part D								
D.1	GC's Home Office Overhead	7.70%					\$25,134	
D.2	GC's Insurance, Payment, Performance Bond	3.30%					\$10,772	
D.3	GC's Profit - New Construction 3%	3.00%					\$10,870	
			Total Part C Construction Cost Contingency				\$46,775	
			Total Part A through D				\$373,189	
Part E								
	Cost Escalation Factor							
	Months	12						
	Monthly Factor	0.291%					\$13,032	
			Total Part A through E				\$386,221	

Part F								
F.1	State, Local & Federal Review				1,000.00		\$1,000	USACE, State plan review fee
F.2	Construction Permits				1,500.00		\$1,500	NPDES, Section 404, temp. power, etc.
							\$2,500	
							\$388,721	
Total Part F Plan Review Fees								
Total Part A through F								
Part G								
	Applicant's Reserve for Change Order (3 - 7%)	3.00%					\$11,662	
							\$400,383	
Total Part A through G								
Part H								
H.1	Applicant Project Management - Design Phase	1.00%					\$4,004	
H.2	A/E Design Contract Costs (5.6 - 7.6%)	7.60%					\$30,429	
	A/E Inspection, 3%	3.00%					\$12,011	
H.3	Applicant Project Management - Constr. Phase	3.00%					\$12,011	
							\$58,456	
Total Applicant PM and Design Review Cost								
Total Part A through H								
TOTAL FOR BANK STABILIZATION							\$458,838	

Table 5 – Stream Gauges and Monitors

Summersville Middle School - Creek Level Gages & Monitoring System									
		Allowance B-H	Quantity	Units	Unit Price	City Adjustment Factor	RS Means Cost Estimate	Comments	
Part A									
	Gage Poles - 4" diameter x 12' long		11.0	Ea.	400.00	1	\$4,400	Based on Q2, 2017, Closest location Beckley, WV	
	Concrete Bases of Poles - 1 cyd reinforced		11.0	Ea.	950.00	1	\$10,450		
	Cameras with telecommunication capability to monitoring projector		3.0	Ea.	2950.00	1	\$8,850		
			Total Part A Base Construction Cost					\$23,700	
Part B									
B.1	Safety Security (4 - 6%)	4.00%					\$948		
	Temp Services and Utilities (0 - 1%)	1.00%					\$237		
	Quality Control (0 - 1%)	1.00%					\$237		
	Submittals (0 - 5%)	5.00%					\$1,185		
B.2	General Conditions (4.25%)	4.25%					\$1,007		
			Total Part B Gen Requirement/Conditions					\$3,614	
			Total Part A & B					\$27,314	

Part C								
C.1	Prelim. Engineering Analyses (7 - 20%)	10.00%					\$2,731	
	Working Drawing (2 - 10%)	5.00%					\$1,366	
C.2	Facility or Project Type and Complexity	2.00%					\$546	
C.3	Access Contingency (0 - 4%)	2.50%					\$683	
	Storage Contingency (0 - 4%)	2.50%					\$683	
	Staging Contingency (0 - 4%)	2.50%					\$683	
C.4	Economies of Scale (over \$10 millions)	0.00%					\$0	
			Total Part C Construction Cost Contingency				\$6,692	
			Total Part A through C				\$34,006	
Part D								
D.1	GC's Home Office Overhead	7.70%					\$2,618	
D.2	GC's Insurance, Payment, Performance Bond	3.30%					\$1,122	
D.3	GC's Profit - New Construction 3%	3.00%					\$1,132	
			Total Part C Construction Cost Contingency				\$4,873	
			Total Part A through D				\$38,879	
Part E								
	Cost Escalation Factor							
	Months	24						
	Monthly Factor	0.291%					\$2,715	
			Total Part A through E				\$41,595	

Part F								
F.1	State, Local & Federal Review				1,000.00		\$1,000	USCOE, State plan review fee
F.2	Construction Permits				500.00		\$500	Section 404, etc.
							\$1,500	
							\$43,095	
Total Part F Plan Review Fees								
Total Part A through F								
Part G								
	Applicant's Reserve for Change Order (3 - 7%)	3.00%					\$1,293	
							\$44,388	
Total Part A through G								
Part H								
H.1	Applicant Project Management - Design Phase	1.00%					\$444	
H.2	A/E Design Contract Costs (5.6 - 7.6%)	7.60%					\$3,373	
	A/E Inspection, 3%	3.00%					\$1,332	
H.3	Applicant Project Management - Constr. Phase	3.00%					\$1,332	
							\$6,481	
							\$50,868	
							\$50,868	
TOTAL FOR STREAM GUAGES AND MONITORS							\$50,868	

			Total Part A Base Construction Cost				\$642,000	
Part B								
B.1	Safety Security (4 - 6%)	4.00%					\$25,680	
	Temp Services and Utilities (0 - 1%)	1.00%					\$6,420	
	Quality Control (0 - 1%)	1.00%					\$6,420	
	Submittals (0 - 5%)	5.00%					\$32,100	
B.2	General Conditions (4.25%)	4.25%					\$27,285	
			Total Part B General Requirement/Conditions				\$97,905	
			Total Part A & B				\$739,905	
Part C								
C.1	Prelim. Engineering Analyses (7 - 20%)	10.00%					\$73,991	
	Working Drawing (2 - 10%)	5.00%					\$36,995	
C.2	Facility or Project Type and Complexity	2.00%					\$14,798	
C.3	Access Contingency (0 - 4%)	2.50%					\$18,498	
	Storage Contingency (0 - 4%)	2.50%					\$18,498	
	Staging Contingency (0 - 4%)	2.50%					\$18,498	
C.4	Economies of Scale (over \$10 millions)	0.00%					\$0	
			Total Part C Construction Cost Contingency				\$181,277	
			Total Part A through C				\$921,182	

Part D								
D.1	GC's Home Office Overhead	7.70%					\$70,931	
D.2	GC's Insurance, Payment, Performance Bond	3.30%					\$30,399	
D.3	GC's Profit - New Construction 3%	3.00%					\$30,675	
			Total Part C Construction Cost Contingency				\$132,005	
			Total Part A through D				\$1,053,187	
Part E								
	Cost Escalation Factor							
	Months	24						
	Monthly Factor	0.291%					\$73,555	
			Total Part A through E				\$1,126,742	
Part F								
F.1	State, Local & Federal Review				1,200.00		\$1,200	State plan review fee
F.2	Security Consultant				10,000.00		\$10,000	Consultant review and endorsement
			Total Part F Plan Review Fees				\$11,200	
			Total Part A through F				\$1,137,942	
Part G								
	Applicant's Reserve for Change Order (3 - 7%)	3.00%					\$34,138	
			Total Part A through G				\$1,172,080	

Part H								
H.1	Applicant Project Management - Design Phase	1.00%					\$11,721	
H.2	A/E Design Contract Costs (5.6 - 7.5%)	7.60%					\$89,078	
	A/E Inspection, 3%	3.00%					\$35,162	
H.3	Applicant Project Management - Constr. Phase	3.00%					\$35,162	
			Total Applicant PM and Design Review Cost				\$171,124	
			Total Part A through H				\$1,343,204	
TOTAL FOR SAFE ROOMS							\$1,343,204	

Section 5: BCA Report for 406 Mitigation Measures

As per the PAPPG, January 2016, page 95, *mitigation measures must be cost effective.*

Mitigation measures are considered cost effective if any of the following criteria are met:

- 1) The cost for the mitigation measure does not exceed 15 percent of the total eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measure applies.*
- 2) The mitigation measure is specifically listed in Appendix J: Cost-Effective Hazard Mitigation Measures, AND the cost of the mitigation measure does not exceed 100 percent of the eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measure applies*
- 3) The Recipient or Applicant demonstrates through an acceptable benefit-cost analysis (BCA) methodology that the measure is cost-effective. FEMA's BCA software²⁴¹ provides appropriate BCA methodologies.*

Per FEMA cost effectiveness guidance, the *Benefit-Cost Analysis (BCA)* is the method by which the future benefits of a hazard mitigation project are determined and compared to its costs. The end result is a *Benefit-Cost Ratio (BCR)*, which is calculated by a project's total benefits divided by its total costs. The BCR is a numerical expression of the "cost-effectiveness" of a project. A project is considered to be cost effective when the BCR is 1.0 or greater, indicating the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

As part of this process, a BCA was run using the FEMA BCA Tool Kit to determine cost effectiveness of the identified mitigation measures. The Benefit Cost Ratio was determined to be 1.98 demonstrating that the mitigation measures are cost effective. The following Table is the BCA module that was complete for the 406 measures.

12 Jul 2018

Project: **Copy Of Summersville**

Pg 2 of 14

Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV

Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Structure and Mitigation Details For: Copy Of Summersville Middle School, Summersville, West Virginia, , Nicholas

Benefits: \$8,384,479

Costs: \$4,244,545

BCR: 1.98

Hazard: **Damage-Frequency Assessment - Flood**

Mitigation Option: Other flood proofing measures

Latitude:

Longitude:

Project Useful Life: 30

Mitigation Information

Basis of Damages: Historical Damages

Number of Estimated Damage Events: 5

Number of Events with Known Recurrence Intervals: 0

12 Jul 2018

Project: **Copy Of Summersville**

Pg 3 of 14

Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Building

Service Types Provided by Facility:

Service Name	Annual Budget (\$)
Summersville Middle School	\$3,533,275

12 Jul 2018 Project: **Copy Of Summersville** Pg 4 of 14
 Total Benefits: **\$8,384,479** Total Costs: **\$4,244,545** BCR: **1.98**
 Project Number: 4273 Disaster #: DR 4273 WV Program: PA Agency: **FEMA Region 3**
 State: **West Virginia** Point of Contact: Carrie Robinette Analyst: Sam Sunderraj

Historic Damages Before and After Mitigation

Analysis Year: 2018 Analysis Duration: 28 Utilities (\$/day):
 Year Built: 1991 User Input Analysis Duration: Buildings (\$/day): \$9,680.21
 Roads/Bridges (\$/day):

Damages Before Mitigation

Damage Year: 2016
 RI:
 Are Damages In Current Dollars? Yes
 Buildings (Days): 187.0
 Utilities (Days):
 Roads (Days):

Conv Cntr & Vis Bur cost for 6 months (\$)	\$345,688
Conv cntr to Temp Facilities bussing (\$)	\$155
Damages to Facilities (\$)	\$27,378,286
Equipment and Contents (\$)	\$1,583,161
Temp Facilities (\$)	\$2,275,384
Total	\$33,392,872
Total Inflated	\$33,392,872

Damages After Mitigation

RI: 500.00
 Are Damages In Current Dollars? Yes
 Buildings (Days): 5.0
 Utilities (Days):
 Roads (Days):

Temp Facilities (\$)	\$10,000
Total	\$58,401

Volunteers Cost

Number of Volunteers Required:
 Cost of Volunteers Time (\$/Hour/Person):
 Per-Person Cost of Lodging for a Volunteer:
 Number of Hours Volunteered/Person:
 Number of Days Lodging/Volunteer:
 Cost of Volunteers:

12 Jul 2018

Project: **Copy Of Summersville**

Pg 5 of 14

Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year: 2018

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 365.0

Utilities (Days):

Roads (Days):

Temp Facilities (\$)	\$420,384
Total	\$3,953,659
Total Inflated	\$3,953,659

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year:

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 0.0

Utilities (Days):

Roads (Days):

Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Version: 5.3

12 Jul 2018

Project: **Copy Of Summersville**

Pg 6 of 14

Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year: 2017

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 365.0

Utilities (Days):

Roads (Days):

Transition from Con Cntr to Temps (\$)	\$105,579
Temp Facilities (\$)	\$210,192
Total	\$3,849,046
Total Inflated	\$3,849,046

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year: 1991

RI:

Are Damages In Current Dollars? Yes

Buildings (Days):

Utilities (Days):

Roads (Days):

Damages to Facilities (\$)	\$1,000
Total	\$1,000
Total Inflated	\$1,000

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Version: 5.3

12 Jul 2018

Project: **Copy Of Summersville**

Pg 7 of 14

Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year: 2015

RI:

Are Damages In Current Dollars? Yes

Buildings (Days):

Utilities (Days):

Roads (Days):

Damages to Facilities (\$)	\$0
Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year: 2019

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 365.0

Utilities (Days):

Roads (Days):

Temp Facilities (\$)	\$420,384
Total	\$3,953,659
Total Inflated	\$3,953,659

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

12 Jul 2018

Project: Copy Of Summersville

Pg 8 of 14

Total Benefits: \$8,384,479

Total Costs: \$4,244,545

BCR: 1.98

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: FEMA Region 3

State: West Virginia

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year: 2020

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 365.0

Utilities (Days):

Roads (Days):

Temp Facilities (\$)	\$420,384
Total	\$3,953,659
Total Inflated	\$3,953,659

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year: 2021

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 365.0

Utilities (Days):

Roads (Days):

Temp Facilities (\$)	\$420,384
Total	\$3,953,659
Total Inflated	\$3,953,659

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Version: 5.3

12 Jul 2018

Project: **Copy Of Summersville**

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Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year: 2022

RI:

Are Damages In Current Dollars? Yes

Buildings (Days): 365.0

Utilities (Days):

Roads (Days):

Temp Facilities (\$)	\$420,384
Total	\$3,953,659
Total Inflated	\$3,953,659

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

12 Jul 2018

Project: **Copy Of Summersville**

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Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

12 Jul 2018

Project: **Copy Of Summersville**

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Total Benefits: **\$8,384,479**

Total Costs: **\$4,244,545**

BCR: **1.98**

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: **FEMA Region 3**

State: **West Virginia**

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	\$0
Total Inflated	\$0

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

12 Jul 2018

Project: Copy Of Summersville

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Total Benefits: \$8,384,479

Total Costs: \$4,244,545

BCR: 1.98

Project Number: 4273

Disaster #: DR 4273 WV Program: PA

Agency: FEMA Region 3

State: West Virginia

Point of Contact: Carrie Robinette

Analyst: Sam Sunderraj

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	
Total Inflated	

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Damage Year:

RI:

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days):

Total	
Total Inflated	

Volunteers Cost

Number of Volunteers Required:

Cost of Volunteers Time (\$/Hour/Person):

Per-Person Cost of Lodging for a Volunteer:

Number of Hours Volunteered/Person:

Number of Days Lodging/Volunteer:

Cost of Volunteers:

Social Benefits

Mental Stress and Anxiety

Lost Productivity

Version: 5.3

12 Jul 2018 Project: **Copy Of Summersville** Pg 13 of 14
 Total Benefits: **\$8,384,479** Total Costs: **\$4,244,545** BCR: **1.98**
 Project Number: 4273 Disaster #: DR 4273 WV Program: PA Agency: **FEMA Region 3**
 State: **West Virginia** Point of Contact: Carrie Robinette Analyst: Sam Sunderraj

Number of Person: 0 Number of Worker: 0
 Treatment Costs per person: \$2,443.00 Productivity Loss per person: \$8,736.00
 Total Mental Stress and Anxiety Cost: \$0.00 Total Lost Productivity Cost: \$0.00

BCR Calculation Results

Expected Annual Damages Before Mitigation	Expected Annual Damages After Mitigation	Expected Avoided Damages After Mitigation (Benefits)
---	--	--

Annual: \$675,792	Annual: \$117	Annual: \$675,675
Present Value: \$8,385,931	Present Value: \$1,452	Present Value: \$8,384,479

Mitigation Benefits: \$8,384,479 Mitigation Costs: \$4,244,545
 Benefits Minus Costs: \$4,139,934 Benefit-Cost Ratio: 1.98

Cost Estimate

Project Useful Life (years): 30	Construction Type:	
Mitigation Project Cost: \$4,182,500	Detailed Scope of Work:	Yes
Annual Project Maintenance Cost: \$5,000	Detailed Estimate for Entire Project:	Yes
Final Mitigation Project Cost: \$4,244,545	Years of Maintenance:	30
Cost Basis Year:	Present Worth of Annual Maintenance Costs:	\$62,045
Construction Start Year:	Estimate Reflects Current Prices:	Yes
Construction End Year:	Project Escalation:	

Justification/Attachments

Version: 5.3

12 Jul 2018 Project: **Copy Of Summersville** Pg 14 of 14
 Total Benefits: **\$8,384,479** Total Costs: **\$4,244,545** BCR: **1.98**
 Project Number: 4273 Disaster #: DR 4273 WV Program: PA Agency: **FEMA Region 3**
 State: **West Virginia** Point of Contact: Carrie Robinette Analyst: Sam Sunderraj

Field	Description	Attachments
Historic damages before mitigation	SMS PW 155 1 Part 1.pdf 105,578.97; SMS bussing cost.pdf 154.50 SMS PW79 part Contents.pdf 1,583,161.25;SMS PW 115 part.pdf 345,688.22; SMS temp estimates.pdf 2,275,384 (this cost includes set up and removal and 12 month rental of 420,384);	
Service types provided by facility	Annual Expenditure from PDMG - refer to e-mail from Carrie "FW:Question"	

APPENDIX A

CAREER TECHNICAL EDUCATION FACILITY

DESCRIPTION AND REQUIREMENTS

Career Technical Education Description

The purpose of this Career Technical Education (CTE) Guidance Document for Facilities Planning is to establish the minimum requirements for developing new CTE programs with enhanced educational opportunities for students. The skills and knowledge offered in these programs are essential in preparing students for high-demand technical careers of today and tomorrow.

The West Virginia Department of Education (WVDE) has the responsibility to provide guidance and assistance to counties in their efforts to continuously improve all aspects of educational programming, including physical facilities. The WVDE endeavors to fulfill its leadership responsibilities and assist in establishing a thorough and efficient system of education for all the students of West Virginia. This handbook has been prepared to assist public school officials in planning and constructing new career technical education facilities, additions and major renovations. This will enable West Virginia's 55 county school systems to provide equal educational opportunities for all students.

Critical planning must precede the construction of facilities, or the purchase of equipment and materials. Key stakeholder groups/participants should be involved in the planning of a CTE program including representatives from the identified industry sector, feeder schools and programs, institutions of post-secondary education, and curricular disciplines. Planning should reference data pertaining to local and regional labor markets and should be conducted in coordination with similar programs at institutions of higher learning such as community colleges or technical institutes.

CTE Advisory Committee: Schools must have a board-appointed Career Technical Education Advisory Committee to develop recommendations on the CTE program and provide liaison between the school and potential employers. Committee's should include one or more representatives of the 1) general public knowledgeable about the disadvantaged, 2) students, 3) teachers, 4) business, 5) industry, 6) school administration, 7) community colleges, and 8) other post-secondary schools. The advisory committee should review the pathway subcommittee work and determine which programs to support and forward to the Facilities Committee to determine infrastructure and site design requirements such as parking, access, utilities, equipment layout and facility design.

Pathway Committee: In addition to the advisory committee, a school may wish to form pathway-specific subcommittees composed of local industry leaders, who will work along with high school CTE teaching staff and principals to focus the specific CTE programs with regards to curriculum, facility design and equipment needs. Each of your programs may already have this advisory committee if they access Carl Perkins grant

funding. The pathway specific subcommittee should advise on the design of the program, special equipment and lab requirements.

Facilities Committee: The school should also have a facilities committee, made up of Maintenance and Facilities Directors, architects and project managers, who should liaison with the High School teaching staff and Principal on the facility requirements and application. The Facilities Committee would then provide design and cost estimates back to the School Building Authority and WVDE office of Technical Education & Governor's Economic Initiatives. These groups will assist with final projects.

Facilities: Success of Career and Technical Education programs is dependent on adequate and well-equipped facilities that stay current with the business, industry, and other employment categories they represent. To assure successful learning, the physical facilities for each program should meet the following requirements:

- Size and space for each program is adequate to accommodate the number of students enrolled.
- Space is arranged for maximum flexibility and ease in teacher supervision of multiple activities.
- Permanent furnishings and equipment are adequate in number and in good operating condition.
- There is adequate provision for maintaining service systems in good working condition (e.g., electricity, water, light control).
- Classrooms, laboratories, auxiliary areas (finish rooms, storage), and other facilities are adequate in design, suitability, and quantity to enable students to meet the specified objectives.
- Each teacher is assigned a conveniently located, furnished, and equipped area for planning, record keeping, consultation, and administration.
- All facilities meet the requirements of the Environmental Protection Agency and Occupational Safety & Health Administration.
- Restrooms and dressing rooms are located to provide convenient access to students of either gender.
- Facilities have been modified to accommodate disabled students.
- Adequate provisions exist for the safety and health of students and teachers.

For further information about facilities, refer to the *Career Technical Education Guidance Document for Facilities Planning*.

Equipment, Materials, And Supplies: Students differ widely in interests, abilities, background, learning styles, prerequisite knowledge, and skills. The variations that exist in students make it equally important that a wide range of current and bias-free instructional materials be made available to students.

If students are to get the most out of occupational and practical life skills, they must have the opportunity to practice the tasks involved. This means that an appropriate quantity of consumable supplies must be available to students and teachers for practice and demonstration activities.

Rapid changes in technology require a regular update of tools, equipment, and raw materials. The LEA must respond to modern technological advances by maintaining an on-going schedule for updating all tools, equipment, and materials used by students in laboratory activities. In general, the LEA should plan to have the following available for each program:

- Up-to-date equipment and instructional aids in adequate quantity and quality to permit appropriate practice in laboratory instruction.
- A budget that permits adding, replacing, and updating equipment and materials.
- A budget that permits consumable supplies (such as food, lumber, ingredients for mortar, etc.) to be made available in sufficient quantities and at appropriate times.
- Currently adopted textbooks (or their equivalent) and pertinent supplementary books readily available in adequate supply and in usable condition.
- A variety of bias-free instructional materials that can accommodate a great diversity of student interests.

Also, the LEA should ensure that all tools and equipment are kept repaired and in good working order. Adequate instructional support and resource materials should be available at each teaching station or easily obtained from the media center or other central location.

For further information about specific equipment, refer to the *Career Technical Education Guidance Document for Facilities Planning*.

Class Size: Enrollment in each class is to be of a size that ensures effective instruction as prescribed in the individual course descriptions in *Career Technical Education Guidance Document for Facilities Planning* When —Maximum Enrollment¹¹ is indicated, this shows the maximum number of students that are permitted in the course based on legal restrictions, guidelines from regulatory or credentialing agencies, or to provide for the safety of students and teachers.

Recommended Maximum Enrollment¹¹ is based on best educational practices to maintain an appropriate instructional environment. Maximum figures are recommended for each course based on the:

- Degree to which student safety is involved in the learning process.
- Desired level of learning outcomes for students in the course.
- Type of instructional activities involved.
- Type, quantity, and size of instructional equipment, materials, and supplies.
- Amount of space needed by students and teachers for instructional purposes.

Factors influencing the number of students for any particular course should take into consideration the availability of laboratories, availability of qualified instructors, adequacy of preparation time, cooperative on-the-job placement, internship arrangements, number of classroom work stations, and class scheduling requirements.

The New

Nicholas County Comprehensive High School

Summersville Middle School

Nicholas County Board of Education

Program of Spaces for CTE Facility at the Glade Creek Property

Prepared by ZMM, Inc., Architects & Engineers
August 1, 2018

Projected Enrollment = 1,400 Grades 6-12

		No.	Size	Ext.	Subtotal	Acres
AG0130 Forest Industry						
AG0210 Plant Systems Technology						
c1.	Plant Systems Classroom	1	@	950	950	
c2.	Classroom Machinery and Material Storage	1	@	600	600	
c3.	Lab Greenhouse Area	1	@	1,000	1,000	
c4.	Lab Machinery and Material Storage	1	@	600	600	
c5.	Greenhouse	1	@	1,200	1,200	
c6.	Instructor's Office	1	@	150	150	
c7.	Outside Classroom Area					4
					4,500	

Provide Outside Classroom space for a Garden area, Greenhouses, Sawmill and Lumber storage area. Provide enough area for expansion and lay down area for log storage and delivery prior to cutting. Area must include space for large equipment storage and maneuvering large trucks.

								No.	Size	Ext.	Subtotal	Acres
AR1600 HVAC Technician Program												
d1.	HVAC Classroom		1 @	1,000	1,000							
d2.	HVAC Laboratory		1 @	3,000	3,000							
d3.	Instructor's Office		1 @	125	125							
d4.	Outside Classroom Area									3		
								4,125				

Provide Outside Classroom space for Delivery and Storage of HVAC Equipment as well as working on Outside Equipment. There must be enough space for placing HVAC equipment on roof Curbs and simulating real life situations.

								No.	Size	Ext.	Subtotal	Acres
AR1820 Carpentry Program												
e1.	HVAC Classroom		1 @	1,000	1,000							
e2.	HVAC Laboratory		1 @	3,000	3,000							
e3.	Instructor's Office		1 @	125	125							
e4.	Outside Classroom Area									3		
								4,125				

Provide Outside Classroom space for Delivery and Storage of lumber and equipment. There must be enough space for working on projects and building small storage buildings and storing them for sale. Additionally there should be enough room for building "tiny houses" for competition and sale. Students will also be working on modular homes on site.

								No.	Size	Ext.	Subtotal	Acres
GO1070 JROTC Program												
f1.	Classroom		1 @	750	750							
f2.	Training Aids Storage		1 @	300	300							
f3.	Property Storage		1 @	650	650							
f3.	Air Rifle Storage Room		1 @	250	250							
f4.	Instructor's Office		1 @	125	125							
f5.	Instructors Office and Shower		1 @	180	180							
f6.	Boy's Locker Room		1 @	200	200							
f7.	Girl's Locker Room		1 @	200	200							
f8.	Drill Room/Indoor Range		1 @	2,500	2,500							
f9.	Outside Classroom Area									5		
								5,155				

Provide Outside Classroom areas for an Outside Shooting Range, Obstacle Course, Drill area and Additional space for Fitness Training.

HE0723 Therapeutic Services Program							
		No.		Size	Ext.	Subtotal	Acres
g1.	Health Science Theory Classroom	1	@	1,125	1,125		
g2.	Equipment Simulation Laboratory	1	@	2,000	2,000		
g3.	Equipment/Storage Area	1	@	200	200		
g4.	Instructor's Office	1	@	125	125		
g5.	Restrooms	2	@	70	140		
g6.	Utility Area	1	@	125	125		
g7.	Boy's Locker Room	1	@	200	200		
g8.	Girl's Locker Room	1	@	200	200		
						4,115	

HO1010 Pro-Start Restaurant Management Program							
		No.		Size	Ext.	Subtotal	Acres
h1.	Classroom	1	@	1,320	1,320		
h2.	Equipment Simulation Laboratory	1	@	2,400	2,400		
h3.	Equipment/Storage Area	1	@	200	200		
h4.	Instructor's Office	1	@	125	125		
						4,045	

MA1980 Welding Program							
		No.		Size	Ext.	Subtotal	Acres
i1.	Classroom	1	@	1,000	1,000		
i2.	Instructional Area	1	@	3,000	3,000		
i3.	Boy's Locker Room	1	@	200	200		
i4.	Girl's Locker Room	1	@	200	200		
i5.	Instructor's Office	1	@	125	125		
i6.	Outside Classroom Area						3
						4,525	

Provide Outside Classroom Area for the storage of large materials. Large steel pieces and pipe will be stored on racks outside the Weld Shop in covered areas. There should be room for maneuvering trucks and lifts for the larger pieces of steel. There should also be room to work and teach outside in real world situations. Some of the air and gas tanks will be stored outside in fenced areas.

		No.		Size	Ext.	Subtotal	Acres
ST2460 Pre-engineering - Project Lead the Way Program							
j1.	Classroom	1	@	1,000	1,000		
j2.	Instructional Area	1	@	3,000	3,000		
j3.	Boy's Locker Room	1	@	200	200		
j4.	Girl's Locker Room	1	@	200	200		
j5.	Instructor's Office	1	@	125	125		
j6.	Outdoor Classroom Space						2
						4,525	

Provide Outside Classroom Area for the delivery of equipment, supplies and project development.

		No.		Size	Ext.	Subtotal	Acres
TR1620 Automotive Technology Program							
k1.	Classroom	1	@	1,000	1,000		
k2.	Instructional Area	1	@	3,000	3,000		
k3.	Boy's Locker Room	1	@	200	200		
k4.	Girl's Locker Room	1	@	200	200		
k5.	Instructor's Office	1	@	125	125		
k6.	Outdoor Classroom Space						3
						4,525	

Provide Outside Classroom Area for the delivery of Automobiles, Equipment and Parts. Enough room should be available for maneuvering and storage of several automobiles in various stages of repair. Students should be able to have enough room to provide a safe working environment around the automobiles.

General Acreage for Classroom and Accessibility for Services		17
Acreage for Outdoor Classroom, Learning Spaces and Building Services		23
Acreage Required		40

Acreage listed is for the actual building spaces as well as the outdoor learning areas. Additional space is added for servicing all areas of the CTE Program. All general shop areas need additional space for general placement and traffic flow around the actual facility for both general access and fire department access.

Career Technical Center (CTE) Subtotal		39,640
Circulation Area, Walls etc. @ 30%		11,892
Career Technical Center Total		51,532

WV SBOE Policy 2510 – CTE Program Description Requirements

AG0210 Plant Systems Program	
Classroom Space	Curriculum requires space for classroom and lab areas.
Size	Base preliminary determination of area upon allotment of 30 to 40 square feet per student (minimum of 750 square feet), exclusive of storage space. Preferred classroom size is 950-1200 square feet. If classroom space is based on the minimum of 30 square feet per student (750 square feet total), an additional 200 square feet should be provided for a demonstration and work area, wet sink, etc.
Design Capacity	25 students.
Location	Convenient or direct access to lab facilities and office on ground floor and convenient to a building entrance.
Activities	Speaking; laboratory activities; presentations; distance learning; virtual learning; group discussion; collaborative project-based learning; interactive boards; desk and/or tables; displaying students' work; storing instructional materials and supplies; demonstrations; and lab activities where stations with individual and collaborative assignments are to be done with manipulative materials and a wide range of technologies
Instructor's Office and Storage Area	Minimum size of 100-150 square feet with convenient or direct access to lab and classroom area
Space Equipment/Storage Area	Teacher's desk and chair with one or two conference chairs. Letter size; 4-drawer file cabinet; minimum 2 legal size; 4-drawer file cabinets; duplex electrical outlets as per NEC, network computer drops, computer workstations, computer and printer, phone with voicemail, storage, adjustable shelving of various heights and depths.
Specializations Specialization A - Fruit and Vegetable Production Specialization C - Floriculture Specialization D - Turf and Landscape Systems	Activities -
Equipment Space and Facilities	
Machinery and Material Storage Area	Minimum size of 600 square feet adjacent to the lab.
Lab	No physical structure is needed to accomplish hands-on skills.
Specialization B - Greenhouse Production and Management	Activities – Seeding, planting, transplanting, and fertilizing plants to be raised to maturity to sell.
Equipment Space and Facilities	Frost-proof hose bibs and GFCI outlets as per NEC
Special Structure or Instructional Area	Greenhouse – minimum size of 22 feet X 48 feet, convenient access to other program facilities, located to receive full sunlight during winter, aisles must be meet ADA requirements.
Machinery and Material Storage Area	Minimum size of 600 square feet adjacent to the lab.
Lab	Greenhouse – minimum size of 22 feet X 48 feet, convenient access to other program facilities, located to receive full sunlight during winter, aisles must be meet ADA requirements.

AR1600 HVAC Technician Program

Classroom Space	Curriculum requires space for classroom and lab areas.
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AR1600 HVAC Technician Program	
Size	Classroom – base preliminary determination of area upon allotment of 25 to 30 square feet per student, approximately 1,000 square feet.
Design Capacity	20 students
Location	<ul style="list-style-type: none"> • High noise labs are to be isolated from quiet area of the school • Location to provide easy delivery of instructional supplies, materials and equipment • Location convenient to parking area for adult education classes • Convenient access for individuals with disabilities.
Activities	Construct, test, operate, and service equipment and tools; provide personal services for customers; depicting, shaping, forming, assembling, and servicing equipment and materials; demonstrations, presentations, lectures, and individualized instruction.
Equipment Space and Facilities	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment will vary with the occupational objectives of the program. Complete equipment listing can be located in the AR1600 HVAC Technician Content Skill Sets. • Instructional technology – Refer to Section 302 • Instructional board and bulletin board - 6 linear feet, minimum • Window sills should be high enough to permit installation of equipment along wall - 4 feet, minimum • Provide appropriate fire extinguishers for equipment and materials used in program • Consultation should be made with Office of Technical Instruction for equipment needs of various occupational areas.
Special Structure or Instructional Area	<ul style="list-style-type: none"> • A minimum of 120 square feet per student work station • Hose Bibb • Compressed air • Concrete floors • Exhaust system • Student wash area • Natural gas • Access driveway • Tool room • 208 Volts, minimum • Dressing and restroom facilities for male and female students • Separate electrical circuit with ground fault • A heating, ventilating, and air conditioning (HVAC) system, which meets ASHRAE Standards • Industry approved storage unit for oxy-fuel supplies
Machinery and Material Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry

AR1600 HVAC Technician Program	
	<ul style="list-style-type: none"> • Storage room - 80 square feet
Instructor's Office and Storage Area	<ul style="list-style-type: none"> • An office should be 150-200 square feet and have a clear window or partition separating the office from the classroom • Teacher's desk and chair • Telephone with voice and data outlets • Computer • Printer • Paper shredder • Lockable file storage with space for technology equipment and student records
Space Equipment/Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment and storage will vary with the occupational objectives of the program
Lab	Approximately 3,500 to 4,500 square feet (combined classroom/laboratory/storage)

AR1820 Carpentry Program	
Classroom Space	Curriculum requires space for classroom and lab areas.
Size	Classroom – base preliminary determination of area upon allotment of 25 to 30 square feet per student, approximately 1,000 square feet.
Design Capacity	20 students
Location	<ul style="list-style-type: none"> • High noise labs are to be isolated from quiet area of the school • Location to provide easy delivery of instructional supplies, materials and equipment • Location convenient to parking area for adult education classes • Convenient access for individuals with disabilities.
Activities	Construct, test, operate, and service equipment and tools; provide personal services for customers; depicting, shaping, forming, assembling, and servicing equipment and materials; demonstrations, presentations, lectures, and individualized instruction.
Equipment Space and Facilities	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment will vary with the occupational objectives of the program. Complete equipment listing can be located in the AR1820 Carpentry Content Skill Sets. • Instructional technology – Refer to Section 302 • Instructional board and bulletin board - 6 linear feet, minimum • Window sills should be high enough to permit installation of equipment along wall - 4 feet, minimum

	<ul style="list-style-type: none"> • Provide appropriate fire extinguishers for equipment and materials used in program • Consultation should be made with Office of Technical Instruction for equipment needs of various occupational areas.
Special Structure or Instructional Area	<ul style="list-style-type: none"> • A minimum of 160 square feet per student work station • Hose Bibb • Compressed air • Concrete floors • Overhead door - 10 feet x 12 feet, minimum • High electrical demand • Exhaust system • Ceiling height - 14 feet, minimum • Student wash area • Spray booths • Heavy machinery • Vents • Natural gas • Master control switch • Ground floor • Access driveway • Tool room • Dust collector • 3 phase power connection • 208 Volts, minimum • Dressing and restroom facilities for male and female students • conditioning (HVAC) system, which meets ASHRAE Standards • Separate electrical circuit with ground fault
Machinery and Material Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Storage room - 80 square feet
Instructor's Office and Storage Area	<ul style="list-style-type: none"> • An office should be 150-200 square feet and have a clear window or partition separating the office from the classroom • Teacher's desk and chair • Telephone with voice and data outlets • Computer • Printer • Paper shredder • Lockable file storage with space for technology equipment and student records
Space Equipment/Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment and storage will vary with the occupational objectives of the program
Lab	Approximately 3,500 to 4,500 square feet (combined classroom/laboratory/storage)

GO1070 JROTC Program	
	program requirements must comply with all the regulations of the associated military branch (e.g. CCR-145-2).
Classroom Space	
Size	
Design Capacity	
Location	
Activities	
Equipment Space and Facilities	
Special Structure or Instructional Area	
Machinery and Material Storage Area	
Instructor's Office and Storage Area	
Space Equipment/Storage Area	
Lab	

HE0723 Therapeutic Services Program	
O789 Clinical Specialty I / 0790 Clinical Specialty II	
Advanced Health Seminar	
Certified Nursing Assistant	
Certified ECG Technician	
Certified Health Unit Coordinator	
Certified Patient Care Technician	
Certified Phlebotomy Technician	
Community Emergency Response Team	
Dental Aide	
Direct Care Worker	
Physical Therapy Aide	
Pre-Pharmacy Technician	
Radiology Aide	
Veterinary Science Aide	
Classroom Space	
Size	Health Science curriculum requires space for small group work areas, project areas and regular classroom instructional space. The suggested average space is 40-45 square feet per student (1,000-1,125 total square feet). In new schools, additions, renovations and supplemental classrooms, provisions that promote the transmission of voice, video and data to all spaces should be provided and consideration should be given for future flexibility and evolving technology. Provisions should be made to provide voice, video and data cables to all equipment in

HE0723 Therapeutic Services Program	
	accessible cable paths that do not interfere with safety of the occupants.
Design Capacity	20 students
Location	The most desirable location for a classroom will be found along a main corridor in a central location receiving maximum student exposure. A first floor location, in a two story building, makes the department easily accessible. The classroom should be within 25 feet of the clinical laboratory and instructor's office.
Activities	Speaking, presentations, virtual learning, group discussion, collaborative project-based learning, interactive boards, display of students' work, storing of instructional materials and supplies, demonstrations, clinical laboratory simulation activities (individual and collaborative assignments) using a wide range of technologies
Equipment Space and Facilities	<p>Theory classroom size is 40-45 square feet per student (1,000-1,125 total square feet).</p> <ul style="list-style-type: none"> • Bulletin boards and/or display areas should be part of the wall space and placed at eye level of the student when seated. • Teacher Work Station and technology with a desktop or notebook computer (optional docking station) with <ul style="list-style-type: none"> ○ Industry supported operating system ○ Office Suite package (Microsoft Office preferred) ○ Network connection (wired or wireless) ○ Internet access ○ DVD drive ○ Antivirus protection ○ Speakers • Data projector or large screen monitor (50" or greater) • Interactive whiteboard and/or mobile interactive presenter • Document camera • Printer access in classroom • Telephone access in classroom • Student Work Station technology tools (student to computer ratio should be one computer for every three students) including a desktop or notebook computer with <ul style="list-style-type: none"> ○ Industry supported operating system ○ Office Suite package (Microsoft Office preferred) ○ Network connection (wired or wireless) ○ Internet access ○ DVD drive ○ Antivirus protection ○ Headphones (optional)

HE0723 Therapeutic Services Program

- Printer access in classroom (1 printer to every 5 computers)
- Mobile or Stationary Computer Lab (125 sq. ft. if stationary with a student to computer ratio of one to one) including a desktop or notebook computer with
 - Industry supported operating system
 - Office Suite package (Microsoft Office preferred)
 - Network connection (wired or wireless)
 - Internet access
 - DVD drive
 - Antivirus protection
 - Headphones (optional)
 - Printer access in lab (printer to computer ratio: 1/5)
- Storage
 - Secure storage for teacher's personal belongings
 - Storage for teaching aids and supplies (including closed and open shelving and a secure drawer filing cabinet)
 - Shelving – wall mounted and open 125 sq. ft.
- Teacher's combination desk and chair
- Conference-type table and chairs
- Desks and chairs or tables and chairs for student seating (Consideration should be given to the type of furnishings for student seating in the theory/classroom area when a one-room floor plan is use. Desks or stackable chairs with tables allow variety and flexibility in the classroom setting.)
- Awards Showcase
- Adequate provision for controlling the light level in instructional areas is essential. For efficient use of projection-type materials, the light in the room, particularly in the area of the projection surface, should not exceed one tenth foot-candle.
- Equipped simulation laboratory – 1500 sq. ft.
- One sink with hot and cold water (provision for hand washing should be installed in the clinical laboratory area) per 10 students. An eye wash station should be available on at least one of the sinks.
- Soap and towel dispenser secured to the wall above or near to sink
- Restroom (1 male and 1 female – 25 sq. ft. each)
- T. Utility Area (150 sq. ft.) cabinet space with washer and dryer (if washer and dryer are located in the clinical lab area and not in separate utility room, adequate space and proper venting should be provided for them). Adequate and properly located plumbing connections must be provided for the equipment with a continuous supply of hot water (a separate hot water heater may be needed).

HE0723 Therapeutic Services Program

- Locker/Dressing room with individual lockers for students (200 sq. ft. with a safety shower)
- Counter top – 3 feet in width around the walls in the room with secure cabinet storage including shelves built in under the counter top (150 sq. ft.)
- Duplex electrical receptacles should be installed on all walls of the instructional space for use of instructional equipment. Sufficient branch electrical circuits should be in each room enabling the instructor to use a variety of instructional strategies. Conduit or other provisions shall be installed to permit future use of instructional technology. There should be proper electrical outlets for the appliances, electric hospital beds, over bed lighting and computers.
- Provision should be made for television and interactive white boards to be permanently installed in each instructional area with provision for data projector connections.
- Acoustical treatment of walls, ceilings and floors in instructional areas, media centers and other such areas.
- Appropriate floor covering and ceiling tile, which is mold and microbial resistant
- Heating, ventilating and air condition (HVAC) system which meets ASHRE standards.

Special Structure or Instructional Area

- Curriculum requires space for small group work areas, project areas and a resource/study area.
- Classroom/theory area with 20 student desks or six roundtables with chairs, teachers' desk (40-45 sq. ft. per student)
 - Clinical Laboratory (75-100 sq. ft. per student)
 - Nurses' station (100 foot work area)
Counter space with refrigerator, sink, and microwave
 - Round or library tables with seating for 20 students
 - Bookcases or bookshelves
 - Awards Showcase
 - Counter top with workspace (minimum 6 ft.) and storage cabinets (countertop and wall)
 - Magazine display rack
 - Computer center (Stationary Computer Lab) 125 sq. ft.
 - All clinical laboratories should have access to locker/dressing room (adjacent to restrooms or divided area for male and female—optional) 200 sq. ft.
 - Restrooms (1 male and 1 female –25 sq. ft. each)
 - Sink with hot and cold water (provision for hand washing should be installed in the clinical laboratory area)
 - Soap and towel dispenser secured to the wall

HE0723 Therapeutic Services Program	
	<ul style="list-style-type: none"> • Locker/Dressing Room • Utility Room with washer and dryer (if washer and dryer are located in the clinical lab area and not in separate utility room, adequate space and proper venting should be provided for them) • Storage and/or workroom area, 200 sq. ft. with shelves (open, wall-mounted)
Machinery and Material Storage Area	<p>All classrooms should have access to 12 square feet of storage area with shelving for general equipment and instructional materials storage. This space is to be included in the total classroom area requirements and should include an area for secure storage.</p>
Instructor's Office and Storage Area	<p>Office space (one teacher) should be 125 sq. ft. and have a clear window or partition separating the office from the classroom. The office should have direct access to the laboratory, instructional space and corridor.</p> <ul style="list-style-type: none"> • Teacher's desk and chair • Telephone with voice and data outlets • Conference chairs – 2 • Computer : Desktop or notebook computer with <ul style="list-style-type: none"> ○ Industry supported operating system ○ Office Suite package (Microsoft Office preferred) ○ Network connection (wired or wireless) ○ Internet access ○ DVD drive ○ Antivirus protection ○ Headphones (optional) • Printer • Paper Shredder • Secure file storage with space for technology and student records • Book shelves
Space Equipment/Storage Area	<p>A total of 200 sq. ft. storage space is needed. (integrated into the storage/work room area) If the secure built in cabinet storage is not available large secure storage cabinet can be purchased to store laboratory and classroom equipment.</p>
Lab	<p>Learning experiences in patient/client care to be provided in a clinical laboratory that allows simulation activities as an extension of the academic and clinical program. The assistance of specialists in health careers and health occupations should be secured in planning these facilities.</p> <ul style="list-style-type: none"> • Clinical laboratory area should meet industry standards. Base determination of space allotment is 75-100 sq. ft. per student (minimum 1500 sq. ft.) • Design capacity in lab – 20 students

HE0723 Therapeutic Services Program	
	<ul style="list-style-type: none"> • Convenient access to instructional space and instructor's office • Equipment should be comparable to that used in industry including <ul style="list-style-type: none"> ○ Provision for hand washing – large single or double sink with foot/knee and/or arm control. ○ Soap dispenser secured to the wall ○ Towel dispenser secured to the wall ○ Washer and dryer (if not in designated utility room) ○ Electric hospital beds (3 or 4 beds as space allows) ○ Over bed lighting ○ Ceiling tracks with curtains should surround each patient unit (bed) for provision of privacy ○ Bed side tables (one for each bed) ○ Over bed tables (one for each bed)

HO1010 Pro-Start Restaurant Management Program	
Classroom Space	Curriculum requires space for small group work areas, project areas, individual work space, classroom instructional space and standard commercial kitchen space. Consideration should be given to future flexibility and evolving technology. Adherence to accepted standards for sanitation and safety is expected. Optimally, lab is adjacent to classroom.
Size	The suggested average space is 40 – 50 square feet per student (total of 1,000 – 1,320square feet). Provision should be made to provide appropriate data, audio, and video cables in accessible cable paths that avoid interference with the occupants. If an entrepreneurial experience is part of the curriculum, that space is added to the classroom design.
Design Capacity	24 students
Location	The most desirable location for the classroom is a first floor location easily accessible to disabled students, adult and community education, entrepreneurial endeavors, laboratory activities and delivery of supplies and materials.
Activities	Food production; collaborative project-based learning; use of interactive boards desk and/or tables ; storing instructional materials and supplies; demonstrations and lab activities ;small and large group interaction individual work; display of students' work; project design, development, and execution; role play of industry related scenarios ; experimentation and production ; distance learning; virtual learning; experimentation; assessment and in school catering

Equipment Space and Facilities

Facilities, equipment, tools, and instructional materials and supplies comply with local, state, and federal health and safety rules and regulations.

- Appropriate floor covering and ceiling tile, which is mold and microbial resistant should be installed.
- Networked color ink or laser printer
- Teacher computer with presentation equipment
- Student computer stations furnished with commercial, professional office/computer furniture
- Lab of 25 stations with network components that meet coding requirements and have internet access
- Presentation board with peripherals (i.e., projector, slate, camera, etc.)
- Electrical outlets for 25 computer stations are needed with additional outlets for equipment such as scanners, mixer, camera, video, speakers, etc.
- Duplex electrical receptacles should be installed on all walls of the instructional space for the use of instructional equipment. Sufficient branch electrical circuits should be in each room. Conduit or other provisions shall be installed to permit future use of instructional technology.
- Acoustical treatment of walls, ceilings and floors in instructional areas, media centers and other such areas, should be installed when audio devices are used.
- Equipment necessary to completing certification competencies Equipment, space, and facility must meet health department guidelines for commercial foodservice
- Potable water
- Selection of preparation, production, service, storage, and disposal meeting industry standards. This includes, but is not limited to, the following:
 - Gas ranges
 - Flat top ranges
 - Electric ranges
 - Salamanders
 - Charbroiler
 - Grill
 - Griddle
 - Tilt top skillets
 - Warmer/proofer
 - Sandwich station
 - Reach in refrigerator
 - Freezer
 - Display refrigerator
 - Ice maker
 - Prep tables
 - Mixers
- Three compartment sink with commercial set up
- Hand washing sink

	<ul style="list-style-type: none"> • Work stations for food production • Commercial dishwashers are appropriate, but not required. If used, the dishwasher must be commercial. • Lockable storage should be used. • Separate storage for chemicals, cleaning supplies, and equipment • Laundry equipment or service • Bulletin board for posting notices and MSDS information Current software and technology for project design, execution, and presentation • Highly flexible work space • Equipment necessary to completing certification competencies <p>Specific equipment and materials for the concentration may be found in the Content Skills section located at http://careertech.k12.wv.us .</p>
Special Structure or Instructional Area	<ul style="list-style-type: none"> • Computer for teacher with presentation board with peripherals (i.e., projector, slate, camera, etc.) • Minimum of computers allowing one per group of three students • DVD or BluRay player (updated as technology evolves) • TV/Monitor • Computer tables • Student work tables with seating for each student • Video/Data projector (ideally, ceiling mounted) • Specific equipment and materials for each concentration may be found in the Content Skill section located at http://careertech.k12.wv.us .
Machinery and Material Storage Area	<p>All classrooms should have access to twelve square feet of storage area with shelving for general equipment and instructional storage. This space is to be included in the total classroom area requirements and should have the capacity to be locked.</p>
Instructor's Office and Storage Area	<p>Size: An appropriate office should be 150-200 square feet. If adjacent to the instructional area, a clear partition or window should separate the areas.</p> <p>Location: Optimal location is next to the classroom.</p> <p>Storage: Lockable storage for files, technology and secure documents</p>
Space Equipment/Storage Area	<ul style="list-style-type: none"> • Teacher's desk and chair • Conference chair (1 or 2) • Phone with voice and data outlets • Computer • Printer • Shredder
Lab	<p>Specific equipment and materials for the concentration may be found in the Content Skills section located at http://careertech.k12.wv.us .</p>

MA1980 Welding Program	
Classroom Space	Curriculum requires space for classroom and lab areas.
Size	Classroom – base preliminary determination of area upon allotment of 25 to 30 square feet per student, approximately 1,000 square feet.
Design Capacity	20 students
Location	<ul style="list-style-type: none"> • High noise labs are to be isolated from quiet area of the school • Location to provide easy delivery of instructional supplies, materials and equipment • Location convenient to parking area for adult education classes • Convenient access for individuals with disabilities.
Activities	Construct, test, operate, and service equipment and tools; provide personal services for customers; depicting, shaping, forming, assembling, and servicing equipment and materials; demonstrations, presentations, lectures, and individualized instruction.
Equipment Space and Facilities	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment will vary with the occupational objectives of the program. Complete equipment listing can be located in the MA1980 Welding Content Skill Sets. • Instructional technology – Refer to Section 302 • Instructional board and bulletin board - 6 linear feet, minimum • Window sills should be high enough to permit installation of equipment along wall - 4 feet, minimum • Provide appropriate fire extinguishers for equipment and materials used in program • Consultation should be made with Office of Technical Instruction for equipment needs of various occupational areas.
Special Structure or Instructional Area	<ul style="list-style-type: none"> • A minimum of 160 square feet per student work station • Compressed air • Concrete floors • Overhead door - 10 feet x 12 feet, minimum • High electrical demand • Exhaust system • Ceiling height - 14 feet, minimum • Student wash area • Vents • Master control switch • Ground floor • Access driveway • Tool room • 3 phase power connection • 208 Volts, minimum • Dressing and restroom facilities for male and female students

	<ul style="list-style-type: none"> • A heating, ventilating, and air conditioning (HVAC) system, which meets ASHRAE Standards • Separate electrical circuit with ground fault • Industry approved storage unit for oxy-fuel supplies • Down draft welding booths
Machinery and Material Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Storage room - 80 square feet
Instructor's Office and Storage Area	<ul style="list-style-type: none"> • An office should be 150-200 square feet and have a clear window or partition separating the office from the classroom • Teacher's desk and chair • Telephone with voice and data outlets • Computer • Printer • Paper shredder • Lockable file storage with space for technology equipment and student records
Space Equipment/Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment and storage will vary with the occupational objectives of the program
Lab	Approximately 3,500 to 4,500 square feet (combined classroom/laboratory/storage)

ST2460 Pre-engineering - Project Lead the Way Program	
Classroom Space	Curriculum requires space for classroom and lab areas.
Size	Classroom – base preliminary determination of area upon allotment of 25 to 30 square feet per student, approximately 1,000 square feet.
Design Capacity	20 students
Location	<ul style="list-style-type: none"> • High noise labs are to be isolated from quiet area of the school • Location to provide easy delivery of instructional supplies, materials and equipment • Location convenient to parking area for adult education classes • Convenient access for individuals with disabilities.
Activities	Construct, test, operate, and service equipment and tools; provide personal services for customers; depicting, shaping, forming, assembling, and servicing equipment and materials; demonstrations, presentations, lectures, and individualized instruction.
Equipment Space and Facilities	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment will vary with the occupational objectives of the program. Complete equipment listing can be located in the ST2460 Pre-engineering - Project Lead the Way Content Skill Sets.

ST2460 Pre-engineering - Project Lead the Way Program	
	<ul style="list-style-type: none"> • Instructional technology – Refer to Section 302 • Instructional board and bulletin board - 6 linear feet, minimum • Window sills should be high enough to permit installation of equipment along wall - 4 feet, minimum • Provide appropriate fire extinguishers for equipment and materials used in program • Consultation should be made with Office of Technical Instruction for equipment needs of various occupational areas.
Special Structure or Instructional Area	<ul style="list-style-type: none"> • A minimum of 120 square feet per student work station • Hose Bibb • Concrete floors • Overhead door - 10 feet x 12 feet, minimum • Ceiling height - 14 feet, minimum • Student wash area • Vents • Master control switch • Ground floor • Access driveway • Tool room • Storage for flammable materials • Dust collector • 208 Volts, minimum • Dressing and restroom facilities for male and female students • Separate electrical circuit with ground fault
Machinery and Material Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Storage room - 80 square feet
Instructor's Office and Storage Area	<ul style="list-style-type: none"> • An office should be 150-200 square feet and have a clear window or partition separating the office from the classroom • Teacher's desk and chair • Telephone with voice and data outlets • Computer • Printer • Paper shredder • Lockable file storage with space for technology equipment and student records
Space Equipment/Storage Area	<ul style="list-style-type: none"> • Equipment should be comparable to that used in industry • Equipment and storage will vary with the occupational objectives of the program
Lab	Approximately 3,500 to 4,500 square feet (combined classroom/laboratory/storage)
Science and Mathematics Pathway	No Concentrations at This Time