Shenandoah Community School District Board of Directors
Shenandoah Administrative Board Room
October 14, 2019 – 5:00 p.m.

Board Agenda

1. Call to Order
2. Roll Call and Determination of Quorum
3. Mission Statement: Read by Director Langley
    a. *The Shenandoah Community School District, in partnership with families and the community, will provide each student an educational environment that maximizes his or her potential to become responsible, successful citizens and lifelong learners in an ever-changing world.*
4. Welcome to Audience
5. Public Forum
6. Administrative Report
    a. Finance Overview – Mrs. Sherri Ruzek
7. Consent Agenda
    a. Minutes
    b. Treasurer's Report
        i. Account Balances
        ii. Unspent Authorized Budget Report
        iii. Accounts Payable
    c. Personnel Requests

Contracts:		
Cindy Sons	Elem Associate Level II/III	$12.34/hr probationary
Jordan Ross	Elem Associate Level I	$12.19/hr probationary
Tabitha Love	Elem Associate Level I	$12.19/hr probationary
Resignations:		
Chelsie Reynolds	HS Associate	effective Oct. 9, 2019
Curtis Osborn	Asst. HS Baseball Coach	
Modifications:		
Sonia Willers	Level I to Level II/III Associate	$14.79/hr

    d. Fundraising Requests
    *on attached sheet
    e. Out of State Travel Requests
    *on attached sheet
    f. Early Graduation Request (December 2019 pending all requirements are met):
        Donald Ryan IV
        Jayden Lutz
    g. Open Enrollment Request
        i. HS – out to Clayton Ridge – deny due to late file, doesn't meet just cause
        ii. MV- in from Sidney – deny due to late file, program requested is full

8. Action Items
    a. Approval of Allowable Growth and Supplemental State Aid for Special Education Deficit in the amount of $203,855.18.
    b. Approval of Allowable Growth and Supplemental State Aid for Limited English Proficiency Program in the amount of $57,827.66
    c. Approve Ahlers & Cooney as SAVE Bond Counsel
    d. Approve Approximately $5,800,000 School Infrastructure Sales, Services and Use Tax Revenue Bonds – Series 2019
        i. Consideration of Financing Proposals Opened and Reviewed by the Superintendent of Schools, Secretary of the Board and the Placement Agent
        ii. Resolution Directing the Sale of Approximately $5,800,000 School Infrastructure Sales, Services and Use Tax Revenue Bonds – Series 2019
    e. Approve Design Development Project Submittal with DLR Group
    f. Approve the Design Development Budget Report with Carl A. Nelson and Company
    g. Set Public Hearing date regarding HS Renovation Project funded using SAVE funds for November 11, 2019
9. Informational Items
    Next Regular Meeting – November 11, 2019 at 5:00 P.M.
10. Adjournment

Shenandoah Community School District
Minutes of the Regular Meeting of the Board of Directors – September 9, 2019
Administration Board Room

Call to Order:
Board President Jean Fichter called the meeting to order at 5:00 pm.
Roll Call:
Roll Call was answered by Directors Kip Anderson, Jean Fichter, Kathy Langley, Greg Ritchey and Adam Van Der Vliet. Also present were Superintendent Dr. Kerri Nelson, School Business Official Sherri Ruzek and Board Secretary Lisa Holmes.
Mission Statement:
The SCSD Mission Statement was read by Director Anderson.
Public Hearing – Proposed Issuance of Approximately $5,800,000 School Infrastructure Sales, Services and Use Tax Revenue Bonds
The public hearing was opened at 5:01 pm. A patron of the district questioned if the figures on the financial fact sheet provided by Piper Jaffray about the general obligation bond were correct, especially regarding the Homestead Tax Credit figure. She also questioned when a needs assessment was done on gym space and asked how much debt the district currently has. These questions were addressed by Dr. Nelson and Mrs. Ruzek. With no other public comment, the public hearing was closed at 5:06 pm.
Welcome to Audience:
President Fichter welcomed everyone to the meeting.
Open Forum:
None
Administrative Reports:
High School Presentation: High School Principal Jason Shaffer shared information with the board about Career Edvantage, a new program being offered through the Avenue of Scholars. Shenandoah is one of four area schools selected to be a part of the program.
Consent Agenda:
Approve the consent agenda to include previous minutes, the financial accounts, the payment of bills, fundraising requests, out of state travel requests and grant requests. Personnel Requests: Contracts: Brent Ehlers, MS Wrestling - $2,610; Hannah Blank, Elementary Associate Level II/III - $12.34/hr probationary; Kyan Kirkholm, MS Girls Basketball - $2,796; Randahl Messenger, Van Driver - $36.30/route, $14.37/hr; Shaylee Taylor-Schoonover, K8 Associate Level II/III - $12.34/hr probationary; Stacy Jones, PT Food Service - $11.92/hr probationary. Resignations: Michelle Tillman, Elementary Associate. Modifications: Amber Taylor, Level II/III to Level I Associate - $12.19/hr probationary; Candice Gates, Level I to Level II/III Associate - $13.49/hr. Early Graduation Requests – December 2019 pending all requirements are met: Hailey Boomgaam, Ian Bennett and Suzann Hensley. Open Enrollment Request – DG out to Clayton Ridge – deny due to late file and does not meet just cause. Motion by Director Ritchey, second by Director Van Der Vliet. Motion carried unanimously.

Action Items:

Appoint Delegate to IASB Delegation Assembly:

Motion by Director Ritchey to appoint Director Van Der Vliet as delegate, second by Director Langley. 4 Ayes with Director Van Der Vliet abstaining – Motion carried.

Approve Issuance of Approximately $5,800,000 School Infrastructure Sales, Service and Use Tax Revenue Bonds:

Motion by Director Ritchey, second by Director Van Der Vliet to approve the issuance of approximately $5,800,000 School Infrastructure Sales, Service and Use Tax Revenue Bonds. Motion carried unanimously.

Acknowledge the Receipt of Petitions Ordering an Election on the Issuance of $14,700,000 General Obligation School Bonds:

Motion by Director Van Der Vliet to receive the petitions, second by Director Langley. Motion carried unanimously.

Approve the Resolution Ordering an Election of the Issuance of $14,700,000 General Obligation School Bonds:

Director Van Der Vliet moved to approve the resolution ordering a special election on the issuance of $14,700,000 general obligation school bonds, second by Director Langley. Ayes – Langley, Ritchey, Van Der Vliet, Fichter. Nays – Anderson. Motion carried by 4-1 vote.

Informational Items:

Regular Meeting – October 14, 2019 at 5:00 pm.

Adjournment:

Motion by Director Van Der Vliet, second by Director Langley to adjourn the meeting at 5:40 pm. Motion carried unanimously.

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Board Secretary Board President

Shenandoah Community School District
Minutes of the Special Meeting of the Board of Directors –September 11, 2019
Administration Board Room

Call to Order:
Board President Jean Fichter called the meeting to order at 3:30 pm.
Roll Call:
Roll Call was answered by Directors Jean Fichter, Kathy Langley (via phone), Greg Ritchey and Adam Van Der Vliet. Also present were Superintendent Dr. Kerri Nelson and Board Secretary Lisa Holmes. Absent was Director Kip Anderson.
Action Items:
Accept the resignation of Board Member Kip Anderson:
Motion by Director Van Der Vliet, second by Director Langley to accept the resignation of Board Member Kip Anderson. Motion carried unanimously.
Informational Items:
Regular Meeting – October 14, 2019 at 5:00 pm.
Adjournment:
Motion by Director Van Der Vliet, second by Director Ritchey to adjourn the meeting at 3:32 pm. Motion carried unanimously.

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Board Secretary Board President

Shenandoah Community School District
Minutes of the Special Meeting of the Board of Directors –September 23, 2019
Administration Board Room

Call to Order:
Board President Jean Fichter called the meeting to order at 5:00 pm.
Roll Call:
Roll Call was answered by Directors Jean Fichter, Kathy Langley, Greg Ritchey (via phone) and Adam Van Der Vliet. Also present were Superintendent Dr. Kerri Nelson, School Business Official Sherri Ruzek and Board Secretary Lisa Holmes.
Action Items:
Approve Placement Agent Agreement with Piper Jaffray:
Motion by Director Ritchey, second by Director Van Der Vliet to approve the placement agreement with Piper Jafffray. Motion carried unanimously.
Approve Distribution of Participant Package by Piper Jaffray:
Motion by Director Langley, second by Director Van Der Vliet to approve the distribution of the participant package by Piper Jaffray. Motion carried unanimously.
Approve AIA B132 Agreement with DLR:
Motion by Director Van Der Vliet, second by Director Langley to approve the AIA B132 agreement with the DLR Group. Motion carried unanimously.
Informational Items:
Regular Meeting – October 14, 2019 at 5:00 pm.
Adjournment:
Motion by Director Langley, second by Director Van Der Vliet to adjourn the meeting at 5:10 pm. Motion carried unanimously.

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Board Secretary Board President

Shenandoah Community School District
Minutes of the Special Meeting of the Board of Directors –October 4, 2019
Administration Board Room

Call to Order:
Board President Jean Fichter called the meeting to order at 9:00 a.m.
Roll Call:
Roll Call was answered by Directors Jean Fichter, Kathy Langley (via phone), Greg Ritchey and Adam Van Der Vliet (via phone). Also present were Superintendent Dr. Kerri Nelson, School Business Official Sherri Ruzek and Board Secretary Lisa Holmes.
Action Items:
Appoint a Board Member to fill the existing vacancy through the end of the term:
Director Ritchey moved to appoint Dr. Timothy Smith to fill the board vacancy through the end of the term which expires with the November election. Director Langley seconded the motion. Motion carried unanimously.
Board Secretary Lisa Holmes administered the oath of office to Dr. Smith.
Informational Items:
Regular Meeting – October 14, 2019 at 5:00 pm.
Adjournment:
Motion by Director Ritchey, second by Director Langley to adjourn the meeting at 9:03 a.m. Motion carried unanimously.

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Board Secretary Board President

SHENANDOAH ACCOUNT BALANCES			SEPTEMBER			
ACCOUNT	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
General Fund (10)						
Beg Balance Checking (Century)	$385,028.81	$16,713.86	$39,613.60			
Beg Balance Savings (Century)	$3,452,321.16	$2,961,633.25	$2,408,233.08			
Revenues	$139,866.08	$275,659.53	$1,276,172.26			
Expenditures	-$1,048,809.69	-$889,845.59	-$1,011,518.98			
End Balance Checking (Century)	$16,713.86	$39,613.60	-$80,237.34			
End Balance Savings (Century)	$2,961,633.25	$2,408,233.08	$2,698,633.71			
Total General Fund	**$2,978,347.11**	**$2,447,846.68**	**$2,618,396.37**	**$0.00**	**$0.00**	**$0.00**
Management Fund (22)						
Beg Balance Checking (Century)	$2,502.74	$3,419.07	$14,855.73			
Beg Balance Savings (Century)	$609,822.39	$609,822.39	$429,197.11			
Revenues Checking	$10,547.31	$19,401.88	$125,964.02			
Expenditures Checking	-$69,088.58	-$188,590.50	-$35,426.22			
End Balance Checking (Century)	$3,419.07	$14,855.73	-$5,228.72			
End Balance Savings (Century)	$609,822.39	$429,197.11	$534,590.64			
Total Management Fund	**$613,241.46**	**$444,052.84**	**$529,361.92**	**$0.00**	**$0.00**	**$0.00**
SAVE Fund (33)						
Beg Balance Checking (Century)	$942,159.72	$729,151.08	$428,569.70			
Beg Balance Savings (Century)	$1,243,509.22	$1,298,438.57	$1,355,420.46			
Revenues Checking	$90,672.33	$92,461.51	$92,111.16			
Expenditures Checking	-$248,751.62	-$336,061.00	-$83,437.90			
End Balance Checking (Century)	$729,151.08	$428,569.70	$380,520.12			
End Balance Savings (Century)	$1,298,438.57	$1,355,420.46	$1,412,143.30			
Total SAVE Fund	**$2,027,589.65**	**$1,783,990.16**	**$1,792,663.42**			
PPEL Fund (36)						
Beg Balance Checking (Century)	$48,444.60	$18,529.74	$5,665.69			
Beg Balance Savings (Century)	$41,099.68	$43,575.97	$175,742.28			
Revenues Checking	$2,502.88	$152,176.67	$53,373.77			
Expenditures Checking	-$29,941.45	-$20,203.29	-$15,640.32			
Expenditures Accts Pay						
End Balance Checking (Century)	$18,529.74	$5,665.69	$25.42			
End Balance Savings (Century)	$43,575.97	$175,742.28	$219,116.00			
Total PPEL Fund	**$62,105.71**	**$181,407.97**	**$219,141.42**	**$0.00**	**$0.00**	**$0.00**
Debt Service Fund (40)						
Beg Balance Checking (Century)	$0.00	$0.00	$0.00			
Beg Balance Savings (Century)	$135,436.35	$144,150.18	$0.00			
Beg Balance Fiscal Agent (Century	$470,235.14	$129,926.38	$164,747.49			
Revenues Checking	$43,860.07	$34,821.11	$34,844.88			
Expenditures Checking	-$375,455.00	-$144,150.18	$0.00			
Transfer						
End Balance Checking (Century)	$0.00	$0.00	$0.00			
End Balance Savings (Century)	$144,150.18	$0.00	$199,588.67			
End Balance Fiscal Agent (Century	$129,926.38	$164,747.49	$3.70			
Total Debt Service Fund	**$274,076.56**	**$164,747.49**	**$199,592.37**			
Total Checking Acct 1	**$767,813.75**	**$488,704.72**	**$295,079.48**			
Total Savings Acct 1	**$5,057,620.36**	**$4,368,592.93**	**$5,064,072.32**			

SHENANDOAH ACCOUNT BALANCES			SEPTEMBER			
Total Savings Acct 15	**$129,926.38**	**$164,747.49**	**$3.70**			
Grand Total Acct 1	**$5,955,360.49**	**$5,022,045.14**	**$5,359,155.50**	**$0.00**	**$0.00**	**$0.00**
Reconciliation						
Bank Statement Checking (Centur	$1,014,458.38	$612,125.55	$542,759.82			
Bank Statement Savings (Century	$5,057,620.36	$4,368,592.93	$4,864,487.35			
Bank Statement Fiscal Agent (Cen	$129,926.38	$164,747.49	$199,588.67			
Less Outstanding Checks	-$247,848.26	-$123,420.83	-$247,680.34			
Oustanding Deposits/GJE	$1,203.63					
Total Reconciliation	**$5,955,360.49**	**$5,022,045.14**	**$5,359,155.50**			
Amount Reconciliation Off	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
ACCOUNT	**JULY**	**AUGUST**	**SEPTEMBER**	**OCTOBER**	**NOVEMBER**	**DECEMBER**
Activity Fund (21)						
Beg Balance Checking	$14,068.48	$11,577.34	$2,894.10			
Beg Balance Savings	$73,453.53	$83,267.07	$89,279.98			
Revenues Savings	$9,869.20	$4,547.70	$49,453.64			
Expenditures Checking	-$2,546.80	-$8,481.83	-$15,334.11			
Expenditures Savings						
End Balance Checking	$11,577.34	$2,894.10	-$2,419.05			
End Balance Savings	$83,267.07	$89,279.98	$128,712.66			
Total Activity Fund	**$94,844.41**	**$92,174.08**	**$126,293.61**	**$0.00**	**$0.00**	**$0.00**
Scholarships (81)						
Beg Balance Checking	$248.00	$0.00	-$1,250.00			
Beg Balance Savings	$390,215.31	$389,061.78	$388,259.63			
Revenues Savings	$198.47	$197.85	$185.10			
Expenditures Checking	-$1,600.00	-$2,250.00	$0.00			
Expenditures Savings						
End Balance Checking		-$1,250.00	$0.00			
End Balance Savings	$389,061.78	$388,259.63	$387,194.73			
Total Scholarships	**$389,061.78**	**$387,009.63**	**$387,194.73**			
Agency Fund (91)						
Beg Bal Checking	**$595.66**	**$595.66**	**$595.66**			
Beg Bal Savings	**$1,391.22**	**$1,391.22**	**$1,391.22**			
Revenues Savings			**$46.10**			
Expenditures Checking			**-$4.88**			
Expenditures Savings						
End Balance Checking	**$595.66**	**$595.66**	**$590.78**			
End Balance Savings	**$1,391.22**	**$1,391.22**	**$1,437.32**			
Total Agency Fund	**$1,986.88**	**$1,986.88**	**$2,028.10**			
Total Checking Acct 2	$12,173.00	$2,239.76	-$1,828.27			
Total Savings Acct 2	$473,720.07	$478,930.83	$517,344.71			
Grand Total Acct 2	**$485,893.07**	**$481,170.59**	**$515,516.44**			

SHENANDOAH ACCOUNT BALANCES			SEPTEMBER			
Reconciliation						
Bank Statement Checking	$14,323.08	$5,834.64	$696.71			
Bank Statement Savings	$84,658.29	$90,671.20	$130,149.98			
Bank Statement Savings	$389,061.78	$388,259.63	$387,194.73			
Less Outstanding Checks	-$2,150.08	-$3,594.88	-$2,524.98			
Outstanding Deposits/GJE						
Total Reconciliation	**$485,893.07**	**$481,170.59**	**$515,516.44**	**$0.00**	**$0.00**	**$0.00**
Amount Reconciliation Off	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

ACCOUNT	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Nutrition (61)						
Beg Balance Checking (Century Ba	$30,168.16	$34,463.71	$49,475.52			
Revenues Checking	$20,471.41	$20,143.15	$35,855.68			
Expenditures Checking	-$16,175.86	-$13,830.59	-$33,350.26			
Loan to Hot Lunch Fund						
Payable Accounts						
End Balance Checking (Century)	$34,463.71	$49,475.52	$51,980.94			
Total Nutrition	**$34,463.71**	**$49,475.52**	**$51,980.94**			
Grand Total Acct 3	**$34,463.71**	**$49,475.52**	**$51,980.94**			
Reconciliation						
Bank Statement Checking (Centur	$34,161.86	$49,277.02	$51,908.34			
Less Outstanding Checks	-$51.50	-$51.50	-$177.40			
Outstanding Withdrawals for Payroll						
Deposits in Transit	$353.35	$250.00	$250.00			
Total Reconciliation	**$34,463.71**	**$49,475.52**	**$51,980.94**			
Amount Reconciliation Off	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

SHENANDOAH COMMUNITY SCHOOL DISTRICT
EXPENDITURES TO CERTIFIED BUDGET COMPARISON
JULY 1, 2019 - JUNE 30, 2020

SEPTEMBER

		FUNCTION	GENERAL	MGMNT	TRUST	PPEL	EMG LEVY/ DISASTER RELIEF	PERL	ACTIVITY
	INSTRUCTION	1XXX	$732,706.89	$123,975.56	$3,850.00				$25,734.10
	SUPPORT SERVICES	2XXX	$748,672.22	$174,358.46		$57,521.19			
	NON-INSTRUCTIONAL	3XXX							
OTHER	FACILITIES ACQ & CONST	4XXX				$4,905.56			
OTHER	DEBT	5XXX							
OTHER	AEA FLOW THROUGH	6100	$117,312.00						
	TRANSFERS								
	TOTAL		$1,598,691.11	$298,334.02	$3,850.00	$62,426.75	$0.00	$0.00	$25,734.10
	PUBLISHED BUDGET		$13,668,222.00	$432,000.00	$0.00	$845,000.00	$0.00	$0.00	$250,000.00
	% USED		11.70%	69.06%	0.00%	7.39%	0.00%	0.00%	10.29%

	FUNCTION	CAPITAL PROJECTS	DEBT SERVICE	NUTRITION	OTHER ENTERPRISE	TOTAL USED	PUB BUDGET	% OF BUDGET
INSTRUCTION	1XXX				$4.88	$886,271.43	$9,570,000.00	9.26%
SUPPORT SERVICES	2XXX	$176,806.51				$1,157,358.38	$4,999,100.00	23.15%
NON-INSTRUCTION	3XXX			$53,965.37		$53,965.37	$750,000.00	7.20%
FACILITIES ACQ & CONST	4XXX	$173,299.39				$178,204.95	$2,565,000.00	6.95%
DEBT	5XXX					$0.00	$430,000.00	0.00%
AEA FLOW THROUGH	6100					$117,312.00	$507,222.00	23.13%
TRANSFER	62xx	$104,089.50	$144,150.18			$248,239.68		
TOTAL		$454,195.40	$144,150.18	$53,965.37	$4.88	$2,641,351.81	$18,821,322.00	14.03%
PUBLISHED BUDGET		$2,865,000.00	$430,000.00	$751,100.00	$0.00			
% USED		15.85%	0.00%	7.18%	0.00%		14.03%	

SHENANDOAH COMMUNITY SCHOOL
CALCULATION OF MISCELLANEOUS INCOME
2019-2020

	STATE AID/ SRCIPVR (CNI) Source Codes 3801, 3803, 3111	TLC/FOUR YEAR-OLD STATE AID/TSS/ INTERVENTION/PD/ TRANSPORTATION Source Code 3116, 3117, 3119 3204, 3216, 3376	SPED DEFICIT SUPPLEMENTAL STATE AID Source Code 3113	AEA FLOWTHROUGH Source Code 3214	PROPERTY TAX Source Codes 1110-1119	INSTRUCTIONAL SUPPORT THROUGH INCOME SURTAXES Source Codes 1134	EXCISE TAXES UTILITY REPL. Source Codes 1170-1179	** MISCELLANEOUS REVENUE	TOTAL REVENUE (Includes Flowthrough)	FY '19 Actuals
JUL				$39,104.00				$17,320.76	$56,424.76	$53,106.44
AUG				$39,104.00	$78,576.06			$18,242.94	$135,923.00	$80,425.92
SEP	$523,628.00	$144,855.00		$39,104.00	$518,824.88		$233.13	$49,527.25	$1,276,172.26	$1,352,737.62
OCT								$0.00		
NOV								$0.00		
DEC								$0.00		
JAN								$0.00		
FEB								$0.00		
MAR								$0.00		
APR								$0.00		
MAY								$0.00		
JUN								$0.00		
TOTAL	$523,628.00	$144,855.00	$0.00	$117,312.00	$597,400.94	$0.00	$233.13	$85,090.95	$1,468,520.02	$1,486,269.98

** Fill in STATE AID, INSTRUCTIONAL SUPPORT, FOUR YEAR-OLD PRESCHOOL, STATE FISCAL STABILIZATION, AEA FLOWTHROUGH, PROPERTY TAX, INCOME SURTAXES, EXCISE TAXES and TOTAL REVENUE columns. The MISC column will automatically be filled in and transferred to the UNSPENT AUTHORIZED BUDGET CALCULATION at the right

Yellow indicates a formula)

SRCIPVR = State Replacement for Commercial and Industrial Property Valuations Reduction

SHENANDOAH COMMUNITY SCHOOL
UNSPENT AUTHORIZED BUDGET CALCULATION
2019-2020

	REGULAR PROGRAM DISTRICT COST	$7,228,816.00			
+	REGULAR PROGRAM BUDGET ADJUSTMENT	$138,542.00			
+	SUPPLEMENTARY WEIGHTING DISTRICT COST	$140,441.00			
+	SPECIAL ED DISTRICT COST	$941,184.00			
+	TEACHER SALARY SUMMPLEMENT DISTRICT COST	$662,009.00			
+	PROF DEV SUPPLEMENT DISTRICT COST	$71,623.00			
+	EARLY INTERVENTION SUPPL DISTRICT COST	$84,109.00			
+	TEACHER LEADERSHIP SUPP DISTRICT COST	$353,567.00			
+	AEA SPECIAL ED SUPPORT	$358,589.00			
+	AEA SPECIAL ED SUPPORT ADJUSTMENT	$1,831.00			
+	AEA MEDIA SERVICES	$59,481.00			
+	AEA EDUCATIONAL SERVICES	$65,755.00			
+	AEA SHARING DISTRICT COST	$0.00			
+	AEA TEACHER SALARY SUPPL DISTRICT COST	$37,007.00			
+	AEA PROF DEV SUPPL DISTRICT COST	$3,959.00			
+	DROPOUT ALLOWABLE GROWTH	$261,868.00			
+	SBRC ALLOWABLE GROWTH OTHER #1	$0.00	Increased Enrollment	(Will have this number in December 2019)	
+	SBRC ALLOWABLE GROWTH OTHER #2	$57,828.00	LEP		
+	SPECIAL ED DEFICIT ALLOWABLE GROWTH	$203,855.18	(Determined when I did the SES at time of CAR - September, 2019)		
-	SPECIAL ED POSITIVE BALANCE REDUCTION	$0.00			
-	AEA SPECIAL ED POSITIVE BALANCE	$0.00			
+	ALLOWANCE FOR CONSTRUCTION PROJECTS	$0.00			
-	UNSPENT ALLOWANCE FOR CONSTRUCTION	$0.00			
+	ENROLLMENT AUDIT ADJUSTMENT	$0.00			
-	AEA PRORATA REDUCTION	$57,385.00			
=	MAXIMUM DISTRICT COST	$10,613,079.18			
+	PRESCHOOL FOUNDATION AID	$247,680.00			
+	INSTRUCTIONAL SUPPORT AUTHORITY	$543,564.00			
+	ED IMPROVEMENT AUTHORITY	$0.00			
+	OTHER MISCELLANEOUS INCOME	$85,090.95	$1,404,271.00	Estimate on Budget Worksheet	This is a fluctuating #.
+	UNSPENT AUTH BUDGET - PREVIOUS YEAR	$3,370,221.00			
=	MAXIMUM AUTHORIZED BUDGET	$14,859,635.13			
-	EXPENDITURES	$1,598,691.11	10.76%		
=	UNSPENT AUTHORIZED BUDGET	$13,260,944.02			

EXPENDITURES	FY 20	FY '19Actuals
JULY	$199,722.68	$217,436.62
AUGUST	$387,449.45	$345,176.12
SEPTEMBER	$1,011,518.98	$966,872.04
OCTOBER		
NOVEMBER		
DECEMBER		
JANUARY		
FEBRUARY		
MARCH		
APRIL		
MAY		
JUNE		
TOTAL	$1,598,691.11	$1,529,484.78

Vendor Name	Invoice Detail Amount	Invoice Detail Description
Checking Account ID 20	Fund Number 61	SCHOOL NUTRITION FUND
AFS	125.90	DAILY SALES-SCHOOL LUNCHES
ANDERSON ERICKSON DAIRY	7,502.11	SNF FOOD FOR THE FOODSERVICE PROGRAM
BMO MASTERCARD	405.44	SNF SUPPLIES
CENTURY BANK/KRISTIN EDWARDS	40.00	SNF SUPPLIES
EARTHGRAINS BAKING CO'S INC	613.32	SNF FOOD FOR THE FOODSERVICE PROGRAM
FAREWAY STORES	149.22	SNF FOOD FOR THE FOODSERVICE PROGRAM
HY-VEE	82.08	SNF FOOD FOR THE FOODSERVICE PROGRAM
KECK FOODS	4,673.58	SNF FOOD FOR THE FOODSERVICE PROGRAM
MARTIN BROS DIST	49,100.45	SNF SUPPLIES
STEVEN WAINWRIGHT	400.00	SNF FOOD FOR THE FOODSERVICE PROGRAM
Fund Number 61	63,092.10	
Checking Account ID 20	63,092.10	
Checking Account ID 3	Fund Number 21	ACTIVITY FUND
AARON PATTEE	110.00	GENERAL ATHLETICS OFFICIAL
ABRAHAM LINCOLN CSD	75.00	ENTRY FEE TO ANOTHER SCHOOL
ANDERSON'S	114.14	SUPPLIES/STUDENT COUNCIL
ANDY REGAN	405.00	GENERAL ATHLETICS OFFICIAL
AUDUBON CSD	100.00	ENTRY FEE TO ANOTHER SCHOOL
BANK IOWA/CONNIE MCGINNIS	100.00	MUSTANG FIELD CONCESSION SUPPLIES
BMO MASTERCARD	1,062.46	TRAVEL/GENERAL ATHLETICS
BMO MASTERCARD	61.93	TRAVEL
BMO MASTERCARD	4,663.23	SUPPLIES/CLASS 2020
BMO MASTERCARD	63.80	SUPPLIES/FCCLA
BMO MASTERCARD	1,014.28	SUPPLIES/FFA
BMO MASTERCARD	1,355.00	DRAMA SUPPLIES
BMO MASTERCARD	403.62	SUPPLIES/STUDENT COUNCIL
BMO MASTERCARD	401.72	MAY MENTORING ACTIVITY SUPPLIES
BMO MASTERCARD	49.98	SUPPLIES/MS ANNUAL
BMO MASTERCARD	26.66	LIFE SKILLS FUNDRAISING SUPPLIES
BMO MASTERCARD	314.33	STUDENT ENTRY & REGISTRATION FEES
BRIAN WEDEMEYER	170.00	GENERAL ATHLETICS OFFICIAL
BRYCE CARRUTHERS	110.00	GENERAL ATHLETICS OFFICIAL
CHAD BURCH	405.00	GENERAL ATHLETICS OFFICIAL
CINDY WILLIAMS	110.00	GENERAL ATHLETICS OFFICIAL
CLARINDA HS	205.00	ENTRY FEE TO ANOTHER SCHOOL
COLBY ESTERLING	110.00	GENERAL ATHLETICS OFFICIAL
COUNTY LINE DESIGN	2,309.00	SUPPLIES/STUDENT COUNCIL
CRESTON CSD	120.00	ENTRY FEE TO ANOTHER SCHOOL
DALE REINKE	110.00	GENERAL ATHLETICS OFFICIAL
DARCY BRUNNER	280.00	GENERAL ATHLETICS OFFICIAL
DENNIS PERRY	110.00	GENERAL ATHLETICS OFFICIAL
DENNY HOWARD	54.00	GENERAL ATHLETIC WORKERS
DOUG MAHER	170.00	GENERAL ATHLETICS OFFICIAL
FAREWAY STORES	4,328.28	MUSTANG FIELD CONCESSION SUPPLIES
GLENWOOD HIGH SCHOOL	90.00	ENTRY FEE TO ANOTHER SCHOOL
GRAPHIC EDGE	423.69	SUPPLIES/GENERAL ATHLETICS
GREG ESTERLING	110.00	GENERAL ATHLETICS OFFICIAL
HEALY AWARDS, INC.	211.86	SUPPLIES/GENERAL ATHLETICS
HOWARD SPORTING GOODS	1,344.69	SUPPLIES/GENERAL ATHLETICS
IGCA SHOOT OUT	50.00	DUES/GENERAL ATHLETICS
IGCA	95.00	DUES/GENERAL ATHLETICS
IOWA FOOTBALL COACHES ASSOCIATION	55.00	DUES/GENERAL ATHLETICS
IOWA HIGH SCHOOL SPEECH ASSOCIATION	345.00	REGISTRATION/SHS SPEECH CLUB
JAMES HANDY	110.00	GENERAL ATHLETICS OFFICIAL
JASON BERNARD	110.00	GENERAL ATHLETICS OFFICIAL
JEFF VOHS	110.00	GENERAL ATHLETICS OFFICIAL

Vendor Name	Invoice Detail Amount	Invoice Detail Description
JEREMY HOFF	110.00	GENERAL ATHLETICS OFFICIAL
JIM MARANVILLE	125.00	GENERAL ATHLETIC WORKERS
JOHN NAHNSEN	235.00	GENERAL ATHLETICS OFFICIAL
JON COLE	75.00	GENERAL ATHLETICS OFFICIAL
JOSTENS	740.32	SUPPLIES/ANNUAL
LASTING INK IMPRESSIONS	455.00	SUPPLIES/CHEERLEADERS
LAUREN KILPATRICK	350.00	DRAMA PURCHASE SERVICE
LEWIS CLEANERS	20.00	SUPPLIES/CHEERLEADERS
MATT BIRD	75.00	GENERAL ATHLETICS OFFICIAL
MATT HOBBIE	330.00	GENERAL ATHLETICS OFFICIAL
MIKE ANDERSON	75.00	GENERAL ATHLETICS OFFICIAL
MILLER BUILDING	52.81	SUPPLIES CLASS OF 2021
MONTY ROLLINS	110.00	GENERAL ATHLETICS OFFICIAL
MT AYR CSD	120.00	ENTRY FEE TO ANOTHER SCHOOL
NICK KEEFE	170.00	GENERAL ATHLETICS OFFICIAL
NICOLE WENSTRAND	70.00	GENERAL ATHLETICS OFFICIAL
NISHNA VALLEY CAFE	1,262.00	MAY MENTORING ACT. STUD& STAFF ADMISSION
NORTHWEST AEA	5.54	SUPPLIES/GENERAL ATHLETICS
NORTHWEST MISSOURI STATE UNIVERSITY	48.00	REGISTRATION/FFA
OA-BCIG	80.00	ENTRY FEE TO ANOTHER SCHOOL
OSBORN, CURTIS	158.00	GENERAL ATHLETIC WORKERS
PHIL KUDRON	110.00	GENERAL ATHLETICS OFFICIAL
PRESTON LAWSON	108.00	GENERAL ATHLETIC WORKERS
RANDY BAXTER	110.00	GENERAL ATHLETICS OFFICIAL
RED OAK HIGH SCHOOL	30.00	ENTRY FEE TO ANOTHER SCHOOL
RENEE KETTWICK	295.00	GENERAL ATHLETICS OFFICIAL
RICHARD BELT	110.00	GENERAL ATHLETICS OFFICIAL
RICK PACE	125.00	GENERAL ATHLETICS OFFICIAL
RIEMAN MUSIC DES MOINES	304.15	RESALE/MARCHING MUSTANGS
ROBERT JOHNSON	110.00	GENERAL ATHLETICS OFFICIAL
ROCSTOP - WHITEHILLS	1,320.00	MUSTANG FIELD CONCESSION SUPPLIES
RON GREBERT	75.00	GENERAL ATHLETICS OFFICIAL
RON HANSEN	180.00	GENERAL ATHLETIC WORKERS
RUSS FINKEN	110.00	GENERAL ATHLETICS OFFICIAL
RYAN MATHENY	72.00	GENERAL ATHLETIC WORKERS
SHARI FOOTE	36.00	GENERAL ATHLETIC WORKERS
SHAWN PETERSEN	110.00	GENERAL ATHLETICS OFFICIAL
SHAWN WHARTON	110.00	GENERAL ATHLETICS OFFICIAL
SHENANDOAH ACTIVITY FUND	40.00	DUES/FCCLA
SOUTHWEST VALLEY SCHOOL	100.00	ENTRY FEE TO ANOTHER SCHOOL
SPORTS PLEX	105.00	MAY MENTORING ACT. STUD& STAFF ADMISSION
STEVE LASTINE	75.00	GENERAL ATHLETICS OFFICIAL
STUART DUSENBERRY	110.00	GENERAL ATHLETICS OFFICIAL
THOMAS JEFFERSON CSD	125.00	ENTRY FEE TO ANOTHER SCHOOL
TOM OLSON	330.00	GENERAL ATHLETICS OFFICIAL
VALLEY PUBLICATIONS	59.94	SUPPLIES CLASS OF 2021
VICKIE RETALLIC	170.00	GENERAL ATHLETICS OFFICIAL
WILLIAM COATS	110.00	GENERAL ATHLETICS OFFICIAL
Fund Number 21	31,174.43	
Checking Account ID 3 Fund Number 81		TRUST FUNDS NON EXPENDABLE
JAKE STENZEL/IOWA STATE UNIVERSITY	75.00	SCHOLARSHIPS/SONDAG ROSCOE
Fund Number 81	75.00	
Checking Account ID 3 Fund Number 91		AGENCY FUND
BMO MASTERCARD	5.56	MIX IT UP SUPPLIES
BMO MASTERCARD	19.52	MIX IT UP SUPPLIES
BMO MASTERCARD	133.00	MIX IT UP SUPPLIES
Fund Number 91	158.08	

Vendor Name	Invoice Detail Amount	Invoice Detail Description
Checking Account ID 3	31,407.51	
Checking Account ID 30 Fund Number 10		GENERAL FUND
ACCO BRANDS USA LLC	306.08	MS GENERAL ED SUPPLIES
AHLERS & COONEY PC	1,357.50	LAWYER/NEGOTIATIONS
AIR FILTER SALES	2,261.66	MAINTENANCE BUILDING SUPPLIES
ASSETGENIE, INC.	754.05	TECH REPAIR & MAINTENANCE SUPPLIES
BARBARA FARWELL	403.25	ESL TRAVEL
BLICK ART MATERIALS	1,922.42	ELEM ART SUPPLIES
BMO MASTERCARD - TRANSPORTATION I	1,818.40	TRANSPORTATION REPAIR PARTS
BMO MASTERCARD	51.93	HS PRINCIPAL FUNDRAISER SUPPLIES
BMO MASTERCARD	3,195.35	ELEM NURSE SUPPLIES
BMO MASTERCARD	1,806.48	HS NURSE GENERAL SUPPLIES
BMO MASTERCARD	510.13	HS FCS SUPPLIES
BMO MASTERCARD	380.19	PLANT SALES/SUPPLIES
BMO MASTERCARD	41.47	HS ROBOTICS SUPPLIES
BMO MASTERCARD	4,821.57	CARL PERKINS SUPPLIES
BMO MASTERCARD	775.00	MS AT RISK WORKSHOP
BMO MASTERCARD	579.17	MENTOR SUPPLIES
BMO MASTERCARD	4,527.06	SUPERINTENDENT SUPPLIES
BMO MASTERCARD	151.79	MS PRINCIPAL SUPPLIES
BMO MASTERCARD	2,148.68	ELEM LIBRARY SUPPLIES
BMO MASTERCARD	4,193.15	PRESCHOOL DONATIONS - GENERAL SUPPLIES
BMO MASTERCARD	3,032.04	TRANSPORTATION SUPPLIES
BMO MASTERCARD	739.32	MAINTENANCE SUPPLIES
BMO MASTERCARD	382.34	HS PRINCIPAL FUNDRAISER SUPPLIES
BMO MASTERCARD	571.32	HS GENERAL ED SUPPLIES
BMO MASTERCARD	1,495.36	PRESCHOOL DONATIONS - GENERAL SUPPLIES
CAMBLIN MECHANICAL	1,750.58	MAINTENANCE BUILDING REPAIR SERVICES
CARSON-DELLOSA PUBLISHING	39.11	ELEM GENERAL ED SUPPLIES
CDW GOVERNMENT	793.75	TECHNOLOGY COORDINATOR SUPPLIES
CENEX FLEET FUELING	4,432.75	MAINTENANCE GASOLINE
CENTERPOINT ENERGY	339.92	UTILITIES-GAS
CENTURYLINK	1,594.36	HS PRINCIPAL TELEPHONE
CHAIR SLIPPERS	149.38	MAINTENANCE SUPPLIES
CHAT MOBILITY	104.75	SUPERINTENDENT TELEPHONE
CITY OF SHENANDOAH	11,537.00	WATER-SEWER
CLARINDA CHAMBER	125.00	MS BAND ENTRY & REGISTRATION FEES
CONTROL MANAGEMENT, INC.	108.00	MAINTENANCE BUILDING REPAIR SERVICES
COUNSEL OFFICE & DOCUMENT	203.88	TECH REPAIR & MAINTENANCE SUPPLIES
CULLIGAN WATER	178.50	MAINTENANCE SUPPLIES
CURRICULUM ASSOCIATES	407.67	EARLY READERS INSTRUCTIONAL SUPPLIES
DINGES AUTO GLASS	175.00	VEHICLE REPAIR SERVICES
DOVEL REFRIGERATION	430.25	MAINTENANCE BUILDING REPAIR SERVICES
EMC INSURANCE COMPANIES	650.00	GENERAL LIABILITY INSURANCE
EWELL EDUCATIONAL SERVICES	325.00	CARL PERKINS SUPPLIES
FAREWAY STORES	38.39	MS PRINCIPAL FUNDRAISER SUPPLIES
FATHER FLANAGANS BOYS HOME	63.75	PROFESSIONAL DEVELOPMENT CURRICULUM
FELD FIRE	369.61	MAINTENANCE BUILDING REPAIR SERVICES
FRESH FACS	64.38	CARL PERKINS SUPPLIES
GET FRAMED	60.00	BOARD SUPPLIES
GLASS GUY, THE	412.41	MAINTENANCE BUILDING REPAIR SERVICES
GLENWOOD CSD	1,737.20	PURCHASE EDUCATIONAL/L3 IND COSTS
GREEN HILLS AEA	525.35	EQ PROF DEV STAFF WORKSHOP/CONF REG
HACH	226.45	HS GENERAL ED SUPPLIES
HOUGHTON MIFFLIN	208.04	MS GENERAL ED TEXTBOOKS
INNOVATIVE OFFICE SOLUTIONS	23.88	SUPERINTENDENT SUPPLIES

Vendor Name	Invoice Detail Amount	Invoice Detail Description
INTERNATIONAL ACADEMY OF SCIENCE	2,500.00	AT RISK SOFTWARE
IOWA COMMUNICATIONS NETWORK	622.82	HS PRINCIPAL TELEPHONE
IOWA DEPARTMENT OF HUMAN SERVICES	1,184.16	MEDICAID DIRECT SERVICES
IOWA HIGH SCHOOL MUSIC ASSOCATION	329.00	HS BAND STUDENT ENTRY & REGISTRATION FEE
IOWA SCHOOL COUNSELORS ASSOCIATION	125.00	HS GENERAL ED TRAVEL
IOWA TESTING PROGRAMS	2,242.60	HS TESTING
IOWA WESTERN COMMUNITY COLLEGE	951.00	NON INSTRUCTION STAFF WORKSHOP/CONF REG
JAY DRUG	21.00	ELEM NURSE SUPPLIES
JB PARTS & SUPPLY	2,409.26	MAINTENANCE SUPPLIES
JOHN GOWING PLUMBING AND HEATING INC.	418.91	MAINTENANCE SUPPLIES
JOSTENS	364.88	HS PRINCIPAL FUNDRAISER SUPPLIES
JULIANE LAROCK	8.93	ELEM SPED LVL III TRAVEL
K-PURCHASE	290.11	TECH REPAIR & MAINTENANCE SUPPLIES
KRIEGLER OFFICE	249.69	BOARD SUPPLIES
LAKESHORE LEARNING	45.96	ELEM GENERAL ED SUPPLIES
LAWN WORLD	265.00	GROUNDS REPAIR SERVICES
LYNN FURNACE	60.00	MAINTENANCE SUPPLIES
MATH LEARNING CENTER, THE	3,129.75	GENERAL SUPPLIES
MENARDS	712.09	HS IND ARTS RESALE INVENTORY
MIDAMERICAN ENERGY	22,888.83	UTILITIES-ELECTRICITY
MILLER BUILDING	1,305.51	PLANT SALES/SUPPLIES
MITEL NET SOLUTIONS	550.23	HS PRINCIPAL TELEPHONE
NASCO	251.28	CARL PERKINS SUPPLIES
NCS PEARSON, INC.	416.00	HS COMB WEIGHT SOFTWARE
NEBRASKA CITY NEWS-PRESS	254.00	BOARD NEWSPAPER ADVERTISING
NEWSBRAIN CIVICS EDUCATION	309.00	MS TECHNOLOGY SOFTWARE
NORTHWEST AEA	397.92	GENERAL SUPPLIES
O'REILLY AUTO	467.10	TRANSPORTATION SUPPLIES
OFFICE DEPOT	10.82	HS GENERAL ED SUPPLIES
ORME ELECTRIC	181.59	MAINTENANCE SUPPLIES
PETERSEN AUTO	3,375.92	VEHICLE REPAIR SERVICES
PRO-ED	40.70	HS SPED LVL III SUPPLIES
RALPH SHAFFER	75.00	HS VOCAL MUSIC SUPPLIES
REALITYWORKS	130.00	CARL PERKINS SUPPLIES
REALLY GREAT READING	285.00	ELEM SPED LVL III SUPPLIES
RED OAK WELDING	155.55	HS RENTAL OF EQUIPMENT AG DEPT
ROGERS PEST CONTROL LLC	210.00	MAINTENANCE PEST CONTROL CONTRACTED
SAPP BROS.	844.51	MAINTENANCE GASOLINE
SCHOLASTIC INC	117.32	CARL PERKINS SUPPLIES
SCHOLASTIC MAGAZINES	839.31	ELEM GENERAL ED SUPPLIES
SHENANDOAH ACTIVITY FUND	82.00	SCHOOL FEES COLLECTED
SHENANDOAH MEDICAL CENTER	50.00	BUS DRIVER PHYSICALS
SHENANDOAH ROTARY	127.00	MENTOR DUES & FEES
SHENANDOAH SANITATION	892.52	MAINTENANCE GARBAGE COLLECTION
SHERIDAN DECORATING	363.87	TSA ADMINISTRATION FEES
SIGNS & SHINES	80.00	TRANSPORTATION SUPPLIES
SITSPOTS	70.91	ELEM GENERAL ED SUPPLIES
SOUTHWESTERN COMM COLLEGE	25.00	NON INSTRUCTION STAFF WORKSHOP/CONF REG
ST. MARY'S CATHOLIC CHURCH	200.00	MENTOR DUES & FEES
SUPPLYWORKS	872.40	CUSTODIAL SUPPLIES
TEACHERS' CURRICULUM INSTITUTE	456.00	ELEM GENERAL ED TEXTBOOKS
TIMBERLINE BILLING SERVICE LLC	106.27	MEDICAID BILLING SERVICES
TRUCK CENTER COMPANIES	451.07	VEHICLE REPAIR SERVICES
VALLEY PUBLICATIONS	1,050.34	BOARD NEWSPAPER ADVERTISING
VERNIER SOFTWARE & TECHNOLOGY	513.78	HS PRINCIPAL FUNDRAISER SUPPLIES
WARDS SCIENCE	63.11	HS PRINCIPAL FUNDRAISER SUPPLIES

Vendor Name	Invoice Detail Amount	Invoice Detail Description
WELLMARK BLUE CROSS BLUESHEILD	110,381.83	HEALTH INSURANCE PAYABLE CN
WORTHINGTON DIRECT	14,861.00	HS LIBRARY FURNITURE & FIXTURES
ZIMCO SUPPLY	109.50	GROUNDS GENERAL SUPPLIES
Fund Number 10	245,092.42	
Checking Account ID 30	Fund Number 22	MANAGEMENT FUND
CAMBLIN MECHANICAL	2,000.64	BUILDING INSURANCE
WELLMARK BLUE CROSS BLUESHEILD	5,228.72	EARLY RETIREES MEDICAL INSURANCE
Fund Number 22	7,229.36	
Checking Account ID 30	Fund Number 33	SAVE{SECURE AN ADVANCED VISION FOR ED.
CARL A. NELSON & CO	12,080.00	ARCHITECT SERVICE
CONTROL MANAGEMENT, INC.	3,452.00	HVAC SYSTEM
DLR GROUP	25,561.34	ARCHITECT SERVICE
FELD FIRE	43,132.00	OTHER EQUIPMENT
OTIS ELEVATOR	3,705.77	OTHER EQUIPMENT
SCHOOL BUS SALES	92,992.00	VEHICLES
WILSON GROUP INC., THE	181,558.29	FURNITURE & FIXTURES
Fund Number 33	362,481.40	
Checking Account ID 30	Fund Number 36	PHYSICAL PLANT & EQUIPMENT
BLUPOINTE DRS	1,500.00	TECH RELATED SOFTWARE
COUNSEL OFFICE & DOCUMENT	2,126.96	ADMIN COPIER LEASE
CULLIGAN WATER	243.47	RENTAL OF EQUIPMENT & VEHICLES
FOLLETT SCHOOL SOLUTIONS INC	691.53	TECH RELATED SOFTWARE
GREAT AMERICAN FINANCIAL SERVICES	1,064.38	ELEMENTARY COPIER LEASE
JOHNSON CONTROLS	3,259.00	BUILDING REPAIR
SOUTHWEST IOWA PARKING LOT	5,997.00	GROUNDS IMPROVEMENTS INFRASTRUCTURE
Fund Number 36	14,882.34	
Checking Account ID 30	629,685.52	

First Name	Last Name	Organization	Start Date	End Date	Name of Fundraiser	What specific funds will be used for	Percentage of profit	Population
Monte	Munsinger	Shenandoah School District	9/20/2019	9/20/2019	Spirit Beads	PBIS Rewards	100%+	Students
Ashleigh	Sons	HS Musical	11/2/2019	11/2/2019	"Seussical Carnival"	To fund our production	100%	Students
Ashleigh	Sons	High School Musical	10/7/2019	11/1/2019	Community Sponsorships	Props, Set, Volunteers, Lights/Sound, etc.	100%	Local or Regional Businesses
Liz	Skillern	Business Professionals of America	11/10/2019	11/30/2019	Cookie Dough Fundraiser with GA	Conference registration, incentives, food, travel, hotel costs	40%	Staff or General Public
Patty and Angel	Roberts and Dawson	SHS Basketball and Wrestling Cheerleading	12/9/2019	1/31/2020	Youth Basketball and Wrestling Cheer Camp (PK-6)	Poster supplies, cheer banquets, Senior Night gifts, registration and hotel costs for ICCA events, camps, cheer t-shirts.	40%-50%	Students

Date	Location	Grade Level/Class	Sponsor
10/18/2019	Vala's Pumpkin Patch	Life Skills 9-12	Mix It Up
10/18/2019	Joslyn Museum, Bemis Center of Contemporary Art (a special exhibit for us to see).	NAHS (viz arts annual trip) 36 students	Crystal Wittmer
11/4/2019	Justo Lamas Concert at Millard West HS, Omaha, NE	Spanish 3-4	Angie Trowbridge

Special Education Supp[redacted] 11:14:02 AM
CAR CERTIFIED on 9/13/2019 11:18:48 AM
Transportation CERTIFIED 9/13/2019 11:14:36 AM
All the records described below are now BROWSE ONLY
Please contact person listed at the bottom of the display
if you need to make further adjustments to this information.
Thank you.

A district may request allowable growth and supplement aid for a negative special education balance for the current school year. The supplemental aid payment will be calculated by the Department of Management after all special education balances have been finalized. If a district has a positive special education balance, they do not have the ability to request allowable growth and supplemental aid. The date listed below indicates when the district's board approved seeking allowable growth and supplemental aid for a negative special education balance.

Our Board approved this action on 10/14/2019

Upload your minutes (PDF or Word): Choose File No file chosen
Upload Minutes

Previous Year Carryover (Screen 4)
$0.00

Weighted Receipts (Screen 4)
$910,909.00

Total Special Education Revenue
$2,129,046.69

Carryover Allowed in Current Year (10% of Weighted Receipts)
$91,090.90

Total Special Education Expenditures
$2,332,901.87

Amount to be Redistributed to Districts with a Negative Balance
$0.00

Special Education Balance in Current Year
($203,855.18)

Amount of Allowable Growth Request
$203,855.18

DISTRICT LEVEL FORMS	STATUS	DATE
Screen 1 - Resident Students Tuitioned Out	COMPLETE	9/24/2019 2:33:32 PM
Screen 2 - Resident Students	COMPLETE	9/13/2019 11:01:50 AM
Screen 3 - Non-Resident Students Tuitioned In	COMPLETE	9/13/2019 11:01:53 AM
Screen 4 - Receipts	COMPLETE	9/13/2019 11:02:02 AM
Screen 5 - Part B Funds	COMPLETE	9/13/2019 11:02:26 AM
Screen 6 - Medicaid Reimbursement	COMPLETE	9/13/2019 11:02:55 AM
Screen 7 - Transportation Costs	COMPLETE	9/13/2019 11:03:30 AM
Screen 8 - Special Education Balance	COMPLETE	9/13/2019 11:03:46 AM
Screen 9 - Maintenance of Effort	COMPLETE	9/13/2019 11:04:22 AM

Iowa Department of Education

Form LEP Allowable Costs Go

District 5976 School 0000 Name Shenandoah Comm School District

LEP Allowable Cost

Due Date: October 1, 2019

Update Web Address

Board minutes are required. Send a copy of the board minutes to Carla Schimelfenig or provide the web address to the minutes here:

Certified on 9/27/2019 2:05:43 PM

Name	Sherri Ruzek
Title	School Business Official
Phone	712-246-1581
Email	ruzeks@shenandoah.k12.ia.us

Program between 410 - 419 Account ID = 9 and Fund = 10 Object by Function		Salaries	Benefits	Purchased Professional	Equip rental/repair	Other (tuition)	Supplies	Equip	Total
		100-199	200-299	300-399	430-449	500-599	600-699	730-739	
1. Instruction	1XXX	86,597.99	23,051.56	36.00	0.00	1,698.97	382.20	0.00	111,766.74
2. Student Support Services	21XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Staff Support Services	22XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Exec Admin	23XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Bldg Admin	24XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Business Admin	25XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. O & M	26XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8. Transportation	27XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9. Community Services	33XX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total		86,597.99	23,051.56	36.00	0.00	1,698.97	382.20	0.00	111,766.74

11. Total (Line 10)		111,766.74
12. Weighted funding received (from October 2017 CE x FY19 DCPP) (2.2 X 6736)	14,819.20	
13. Other resources (expenditures above that have project >0000, excluding 1112)	7,332.17	
14. FY18 state and federal carryover	0.00	
15. MAG on FY19 Application form (from SBRC application form)	1,481.00	
16. Resources Available but unused	0.00	
Total Resources Available (Sum Lines 12 thru 16)	23,632.37	
17. Preliminary Maximum allowable request (Lines 11-Total Resources Available, if positive, otherwise zero)		88,134.37
18. Any expenditure included in the row above that is not expressly allowed by IAC (district input)		0
19. Maximum allowable request (Line 17 minus 18, if positive, otherwise zero)		88,134.37
20. Amount requested (may be less than maximum allowable)		57827.66
	12.00	12.00

21. FTE of LEP students in instructional LEP program on count date (from October 18 SRI/CE)		
22. FTE of LEP students in instructional LEP program at end of year (from SRI Spring 19)	14.00	14.00
23. FTE of teachers exclusively assigned to LEP additional instruction outside of regular classroom instruction. Do not include coordinator or director positions (from Fall BEDS staffing)		1.00
24. FTE of aides (including interpreters) exclusively assigned to LEP additional instruction outside of regular classroom instruction (from Fall BEDS staffing)		1.00
25. Program delivery model as reported in SRI Spring 19		
Dual Language Program	0	
Sheltered Instruction	0	
English as a Second Language (ESL)	14	
Other Bilingual Program	0	
Newcomer Program	0	
Exited ELL During Year	0	
Total	14	
26. Languages represented in LEP population (SRI Spring 19)		
Gujarati	1	
Spanish	12	
Tagalog	1	
27. Student to adult ratio (FTE of students served during year / total of teachers and aides FTE) (0 / 2)		0.00
28. LEP costs per pupil in excess of the DCPP (grand total expenditures / FTE of students served during year) (111766.74 / 0)		0.00
29. % of LEP students from Certified Enrollment October 2018		1.11

Please contact Carla Schimelfenig by email or phone (515)242-5612 with questions regarding this form

AHLERS COONEY
ATTORNEYS

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Des Moines, Iowa 50309-2231
Phone: 515-243-7611
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jwainwright@ahlerslaw.com

October 4, 2019

Kerri Nelson, Superintendent
Shenandoah Community School District
304 West Nishna Road
Shenandoah, IA 51601

Re: Shenandoah Community School District
School Infrastructure Sales, Services and Use Tax Revenue Bonds, Series 2019

Dear Kerri:

We are pleased to be working with you and the Shenandoah Community School District with respect to the issuance of Sales Tax Bonds.

The purpose of this letter is to disclose and memorialize the legal services that we will render in serving as Bond Counsel for the above-referenced financing. Our understanding is that the Bonds will be tax-exempt, revenue obligations of the Shenandoah Community School District (the "District"). We understand you have engaged Piper Jaffray & Co. as your placement agent (the "Placement Agent").

I. DESCRIPTION OF SERVICES

As Bond Counsel to the District, we will work with the District, including the officers and employees, the Placement Agent, and other parties to this transaction to provide the following services:

1. Review the proposed timetable and consult with the other parties to the transaction as necessary in order to implement the financing in accordance with that timetable.

2. Review all relevant Iowa statutory and constitutional provisions, including all pending legislation and any other recent developments, relating to the issuance of the Bonds.

3. Obtain detailed information about the proposed Bond issue and review the nature of public and private ownership and the operation of the facilities financed with the Bond proceeds (the "Project").

4. Consider the issues arising under the Internal Revenue Code of 1986, as amended (the "Code"), and all applicable tax regulations relating to the issuance of the Bonds on a tax-exempt basis in view of the use of the Project and prepare all necessary tax compliance certificates.

5. Prepare or review the issuing resolution, the bond purchase agreement and draft descriptions of these documents as necessary. As Bond Counsel, upon request we will assist the District in reviewing only those sections of any official statement or any other disclosure document to be disseminated in connection with the sale of the Bonds which involve the description of the Bonds, the security for the Bonds and matters pertaining to tax exemption.

6. Prepare all pertinent proceedings to be considered by the District Board of Directors; confirm the necessary quorum, meeting and notice requirements, and draft pertinent excerpts of minutes of the meetings relating to the financing; and supervise the filing of all necessary federal reporting or state public notice requirements for issuing the Bonds.

7. Prepare, revise as necessary, and coordinate the distribution and execution of necessary closing documents and certificates, opinions and document transcripts.

8. Attend or host such drafting sessions and other conferences necessary to implement the financing, including the preclosing, if needed, and closing.

9. Render our customary approving legal opinion regarding the validity of the Bonds, the sources of payment therefor and the federal income tax treatment of interest thereon (the "Bond Opinion"), which opinion will be delivered by us in written form on the date the Bonds are exchanged for their purchase price (the "Closing"). The Bond Opinion will be based on facts and law existing as of its date. In rendering the Bond Opinion, we will rely upon the certified proceedings and other certifications of District officials and other persons furnished to us. We are not engaged and will not provide services intended to verify the truth or accuracy of these proceedings or certifications. We understand that you and other members of the District staff and other employees of and consultants to the District will cooperate with us in this regard. Please note that our opinion represents our legal judgment based upon our review of the law and the facts so supplied to us that we deem relevant and is not a guarantee of result.

II. LIMITATIONS

Our duties as Bond Counsel are limited to those expressly set forth above in this letter. Among other things, our duties ***do not*** include:

1. Except as described in paragraph 5 above, assisting in the preparation or review of an official statement or any other disclosure document with respect to the Bonds, or performing an independent investigation to determine the accuracy, completeness or sufficiency of any such document or rendering any advice, view or comfort that the official statement or other disclosure document does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements contained therein, in light of the circumstances under which they were made, not misleading;

2. We have not been engaged as, and should not be viewed as acting as, Disclosure Counsel;

3. Preparing requests for tax rulings from the Internal Revenue Service;

4. Preparing blue sky or investment surveys with respect to the Bonds;

5. Drafting state legislative amendments;

6. Pursuing test cases or other litigation;

7. Making an investigation or expressing any view as to the creditworthiness of the District or of the Bonds;

8. Opining on a continuing disclosure undertaking pertaining to the Bonds and, after the execution and delivery of the Bonds, providing advice concerning any actions necessary to assure compliance with any continuing disclosure requirements;

9. Responding to Internal Revenue Service audits or Securities and Exchange Commission investigations;

10. After Closing, providing continuing advice to the District or any other party concerning any actions necessary to assure that interest paid on the Bonds will continue to be excluded from gross income for federal income tax purposes, e.g., we will not undertake rebate calculations for the Bonds;

11. Providing any advice, opinion or representation as to the financial feasibility or the fiscal prudence of issuing the Bonds, the financial condition of the District, or to any other aspect of the financing, such as the proposed financing structure, use of a financial advisor, or the investment of proceeds of the Bonds; or

12. Any other matter not specifically set forth above that is not required to render the Bond Opinion.

The Bond Opinion represents our legal judgment based upon our review of the law and the facts that we deem relevant to render such opinion. No assurance can be given as to whether or not the Internal Revenue Service will commence an audit of the Bonds, or as to whether the Internal Revenue Service would agree with the Bond Opinion. If an audit is commenced, the Internal Revenue Service will treat the District as the taxpayer, and the bondholders may have no right to participate in such procedure. As Bond Counsel we are neither obligated to defend the tax-exempt status of the Bonds nor responsible to pay or reimburse the costs of the District or the bondholders with respect to any audit or litigation relating to the Bonds.

III. ATTORNEY-CLIENT RELATIONSHIP

Upon execution of this engagement letter the District will be our client, and an attorney-client relationship will exist between us with respect to the issuance of the Bonds. However, our services as Bond Counsel are limited to those as set forth in this engagement letter, and the District's execution of this engagement letter will constitute an acknowledgment of those limitations. We will not act as an intermediary among the parties to the transaction.

Our representation of the District and the attorney-client relationship created by this engagement letter will be concluded upon the issuance of the Bonds. Nevertheless, subsequent to the Closing, we will prepare and provide a transcript of proceedings pertaining to the Bonds and make certain that a Federal Information Reporting Form 8038-G is filed for the Bonds.

IV. FEES

As is customary, we will bill our fees as Bond Counsel on a transactional basis instead of hourly. Disbursements are typically itemized and billed separately. Factors which affect our billing include: (a) our estimate of the risk involved in our writing our normal "unqualified" approving Bond Opinion (risk is related to the size, complexity and tax questions in the transaction); (b) an estimate of the time necessary to do the work: (c) the complexity of the issue (number of parties, timetable, type of financing and so forth); (d) a recognition that we carry the time for services rendered on our books until a financing is completed, rather than billing monthly or quarterly.

Based on (i) our current understanding of the structure, size and schedule of the financing, (ii) the duties we would undertake pursuant to this letter, (iii) the time we anticipate devoting to the financing; and (iv) the responsibilities we assume, we estimate the fee for our legal services for this transaction will be $11,000 plus costs such as copying, overnight charges, bond printing, and other similar costs. Generally, these expenses will not exceed $500. If at any time we believe that circumstances require an adjustment of our original fee estimates, we will consult with you. Such adjustment might be necessary in the event (i) the principal amount of bonds issued differs significantly from the amount stated at the time we advise you of the fee, (ii) the manner in which the Bonds are marketed (private placement, public offering, etc.) changes, (iii) there are material changes in the structure, security or opinion from the description of the Bonds after we advise you or our fee, or (iv) unusual or unforeseen circumstances arise which require a significant increase in the services rendered, such as personal attendance at meetings, significant travel, or unexpected revision of the issuance documents.

If for any reason the District terminates this engagement before closing or the Bonds are not issued, or if the Bonds are issued without the delivery of our Bond Opinion, we will bill you for the services rendered on your behalf up to that point. These services will be billed at the normal hourly rates for those attorneys and legal assistants who have performed such services. We will also bill you for all expenses we have incurred as outlined above. My current hourly rate is $275. Ron Peeler's current hourly rate is $325. Services performed by legal assistants will be billed at $125 per hour.

Our firm represents, and in the future will represent, other clients including cities, city utilities, counties, school districts, community colleges, area education agencies, the Iowa Public Agency Investment Trust, the Iowa Schools Joint Investment Trust, the Iowa Association of Municipal Utilities, Missouri Basin Municipal Electric Cooperative Association, North Iowa Municipal Electric Cooperative Association, and the Iowa Association of School Business Officials. In addition, other clients of our firm may be involved in transactions or have contacts or involvement with the District.

We do not believe our representation of these clients will adversely affect our ability to represent you as provided in this letter, either because such matters will be sufficiently different from

the issuance of the Bonds by the District so as to make such representation not adverse to our representation of you, or because a potential for such adversity is remote or minor and outweighed by the consideration that it is unlikely that the advice given to other clients will be relevant to any aspect of the issuance of the Bonds.

By approving this letter, the District consents to the firm's continued and future representation of such other clients without the need for any further consents from the District when there is no direct conflict and where matters the firm is handling for either the District or other clients involve legislative or policy issues or administrative proceedings unrelated to the representation of the other client.

If the foregoing terms are acceptable to you, please so indicate by returning a copy of this letter signed by the Board President, retaining the original for your files. If you have any questions, please call. We appreciate the opportunity to work with you on this matter.

Very truly yours,

AHLERS & COONEY, P.C.

James R. Wainwright

JRW:jcp

Accepted and Approved this _____
day of _____, 20__:

SHENANDOAH COMMUNITY SCHOOL DISTRICT

By _____
President of the Board of Directors

01616168-1\18883-022

Shenandoah Community School District
Excellence in Every Endeavor

Shenandoah Community School District High School Renovations

Design Development Project Submittal

Date: **September 25, 2019**

DLR Group
Architecture Engineering Planning Interiors

6457 Frances Street, Omaha, NE 68106
tel 402-393-4100 fax 402-393-8747

Design Development Submittal
Table of Contents

Shenandoah Community School District

School Board

Jean Fichter
Greg Ritchey
Kathy Langley
Adam Van Der Vliet
Timothy Smith

District Leadership

Dr. Kerri Nelson	Superintendent
Sherri Ruzek	Business Manager
Jason Shaffer	High School Principal
Steve Hielen	Building & Grounds

Community Group

Many have been involved in the design process

DLR Group Project Team

Vanessa Schutte	Client Leader / Lead Designer
Mike Kros	Project Manager
Kyle Crouch	Civil
Tim Gilbert	Architectural
Rachel Richter	Interiors
Christie Hasenkamp / Jake McConnell	Structural
Jeff Mooney / Paul Fisher	Mechanical
Eric Kamin / Tim Hilton	Electrical
Peggy Nattermann	Administrative Support

Carl A. Nelson Construction Manager Team

Tim Seibert
Cindy Larson

Vision / Memorable Goals

A. Vision / goal setting was started on November 9, 2016 through a visioning session with the school district and community members. From that session an overall vision was set.

1. Originally we see statements with the most votes:

   a. We see a facility that serves the entire region with programs and services that are available 24/7, serves as a hub for the community, providing technology integration and production.
   b. We see a school focused on individual learning prepared for a wide variety of careers and occupations.
   c. We see Shenandoah schools as the SW Iowa school of choice by preparing all students for their future through experienced-based learning.
   d. We see a district that provides classes where a student can learn language arts, math, science, arts, and vocation all in the same project — project-based learning

2. From that information a combined statement was developed.

> "*We see a facility that serves as a hub for the entire region, offering continuous access to innovative engaging programs, services, and technologies. We see a district that facilitates integrated, project-based learning where students can incorporate a variety of subjects into every endeavor. Through individualized college and career prep — whether it be STEM, CTE, or beyond — we see our school as a place that will prepare each one of our students for their future."*

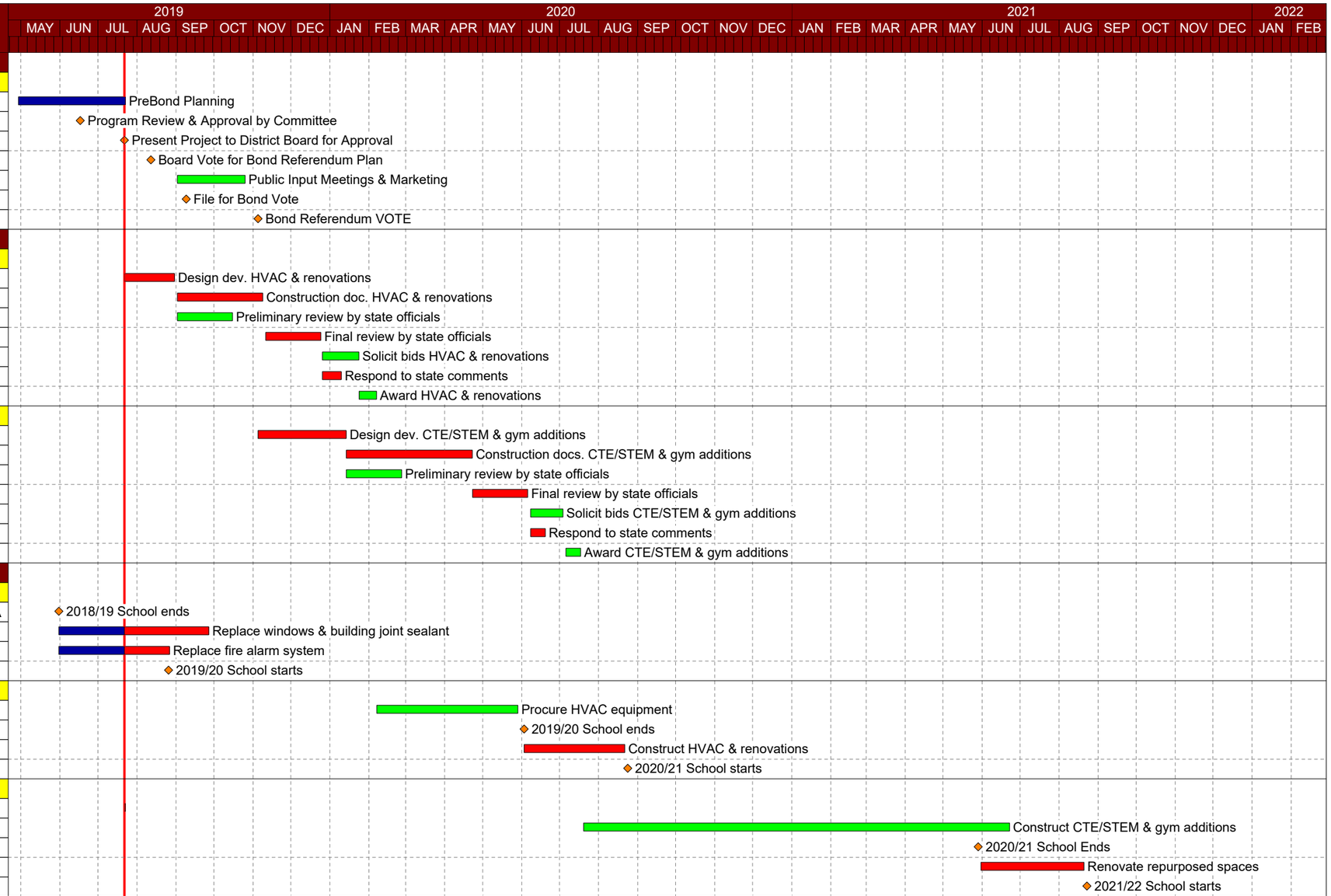
Project Schedule

A. There are separate projects and timelines due to the funding mechanisms. Attached is the graph representing the project schedules.

B. The HVAC & Renovation scope.

1. Design will be complete soon after the bond vote.
2. Sent out for bids by end of the year.
3. Construction to be over the summer of 2020.

ID	Description	Work Days	Early Start	Early Finish
PreBond Planning				
1080	PreBond Planning	50	29APR19 A	22JUL19 A
1000	Program Review & Approval by Committee	0	17JUN19 A	
1040	Present Project to District Board for Approval	0	22JUL19	
1050	Board Vote for Bond Referendum Plan	0	12AUG19 *	
1030	Public Input Meetings & Marketing	40	02SEP19 *	25OCT19
1060	File for Bond Vote	0	09SEP19 *	
1070	Bond Referendum VOTE	0	05NOV19 *	
Design & Preconstruction				
HVAC & Renovation				
1270	Design dev. HVAC & renovations	30	22JUL19	30AUG19
1090	Construction doc. HVAC & renovations	50	02SEP19	08NOV19
1290	Preliminary review by state officials	32	02SEP19	15OCT19
1230	Final review by state officials	32	11NOV19	24DEC19
1110	Solicit bids HVAC & renovations	20	26DEC19	23JAN20
1300	Respond to state comments	10	26DEC19	09JAN20
1240	Award HVAC & renovations	10	24JAN20	06FEB20
CTE/STEM & Gym Additions				
1280	Design dev. CTE/STEM & gym additions	48	05NOV19	13JAN20
1120	Construction docs. CTE/STEM & gym additions	72	14JAN20	22APR20
1301	Preliminary review by state officials	32	14JAN20	26FEB20
1310	Final review by state officials	32	23APR20	05JUN20
1130	Solicit bids CTE/STEM & gym additions	20	08JUN20	03JUL20
1320	Respond to state comments	10	08JUN20	19JUN20
1250	Award CTE/STEM & gym additions	10	06JUL20	17JUL20
Construction				
Summer 2019 Misc.				
1160	2018/19 School ends	0		30MAY19 A
1010	Replace windows & building joint sealant	60	31MAY19 A	26SEP19
1020	Replace fire alarm system	60	31MAY19 A	26AUG19
1170	2019/20 School starts	0	26AUG19 *	
HVAC & Renovation				
1140	Procure HVAC equipment	80	07FEB20	28MAY20
1180	2019/20 School ends	0		02JUN20 *
1100	Construct HVAC & renovations	58	03JUN20	21AUG20
1190	2020/21 School starts	0	24AUG20 *	
CTE/STEM & Gym Additions				
1260		1	22JUL19	22JUL19
1150	Construct CTE/STEM & gym additions	240	20JUL20	22JUN21
1210	2020/21 School Ends	0		28MAY21 *
1200	Renovate repurposed spaces	60	31MAY21	20AUG21
1220	2021/22 School starts	0	23AUG21 *	



Company name	Carl A. Nelson & Co.
Data date	22JUL19
Start date	26APR19
Finish date	20AUG21
Page number	1A
Number/Version	04

NELSON
CARL A. NELSON & CO.
Building Solutions Since 1913

Shenandoah Community School District
High School Renovation and Addition
Project Schedule

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

1.0 Civil Systems

A. General

1. The new Shenandoah High School project will consist of parking lot improvements to meet ADA access requirements.

B. Zoning Requirements and Design Standards

1. The site is currently Zoned R – Residence District. The school is within the current use available to these zoning requirements. It is not anticipated to infringe on any current zoning codes during the design and construction of the two additions.

C. Site Preparation and Demolition

1. Specific and limited site preparation and / or demolition will be required. Demolition will consist of specific concrete panels and paint striping to perform proposed improvements.

D. Site Access

1. Site access will occur from Mustang Drive.

E. Handicap Accessible Pathway

1. Removed and replaced concrete pavement parking stalls shall be 6” thick, or match existing thickness, whichever is greater.
2. Sidewalks will be a minimum of 5” thick and will not include welded wire fabric. Not all sidewalks are laid out on the plan, and further development of the pedestrian network on the site will continue.

F. Utility Services:

1. Parking lot lighting will be added to the existing lot.

G. Landscape and Site Amenities:

1. Proposed landscaping will be minimal for the proposed project scope. Lawn turf grass sod will be installed to all limits of disturbance.

2.0 Architectural Design Narrative

A. The current Existing High School renovation will have major replacement of the HVAC system, lighting and other electrical systems. Interior finishes will be touched up to match existing as needed due to being damaged in construction. A few areas will have a total renovation that include Administration restrooms. There will be very little work if any in the two-level Auditorium wing, Gymnasium and the Storm Shelter addition.

B. Most of the existing windows are currently being replaced. They are not part of this scope.

C. Most of the areas will receive new Acoustical Panel Ceiling (APC) tiles reusing the grid where possible excluding Locker Rooms, Weight Room, Main Vestibule, Auditorium Vestibule, Auditorium Restrooms and Mechanical Room. The exiting Kitchen ceiling and grid is in good condition but need to verify ceiling panel type to see if it can stay as-is. The corridors will have the APC Tiles replaced. The Auditorium Lobby will receive new APC and grid.

D. Replace existing ADA lift in the Auditorium.

E. Auditorium area hardware will be updated to allow for card key access and control.

F. The existing storm shelter is assumed to be large enough to meet the requirements of the school.

G. If additions are not done, some of the alternate existing spaces (Science, CTE and other classrooms) that were to be relocated to new or renovated spaces will be updated for their current function in their current location.

H. Possible minor renovation of existing girls and boys showers and training room.

3.0 Interior Design Narrative

A. The interior concept for the project focuses primarily on student engagement, by developing interests and passions while preparing students for their future. The strongest correlation with student engagement is with the ratings of the perceived values of the school. The more the students perceive that the school values creativity, critical thinking, collaboration and so on, the higher their academic engagement is likely to be. The interior design of the building will focus on these concepts, implementing them into every learning environment. The design will also connect the students to the surrounding community through design inspiration and spaces for the community to become integrated into the success of the students.

B. The following will be implemented as general design features throughout project:

1. Wall Base: Replace wall base wherever it is damaged or removed in construction process.
2. Corridors: Replace all existing Acoustic Ceiling Panel. Use existing grid if it is in good condition and not damaged in renovation. One type of acoustic panel with high NRC rating will be chosen for all spaces.
3. Auditorium Lobby: Replace all existing Acoustic Ceiling Panel and grid to match all other rooms. One type of acoustic panel with high NRC rating will be chosen for all spaces.
4. Classrooms and Miscellaneous Rooms: Replace all existing Acoustic Ceiling Panels. Use existing grid if it is in good condition and not damaged in renovation. One type of acoustic panel with high NRC rating will be chosen for all spaces.
5. Paint: Paint at locations affected by construction (where walls are moved, scratched, etc.)
6. Interior Signage: Provide ADA compliant interior room signage throughout.
7. New Administration Restrooms: Finishes to be porcelain tile floor and ceramic tile on all walls with acoustic panel ceiling. Include square floor drain in restrooms without slope.
8. Boys & Girls Showers: Provide ‘toilet partition’ construction shower stalls. Replace floor tile and base in entirety of shower area and toilet area as needed. Paint walls with high performance coating. Flooring options are tile or resinous flooring system.
9. Referee/ADA Shower Room: Provide Fiberglass Reinforced Plastic at shower walls and porcelain tile. Provide shower floor system of either tile or resinous flooring system. Shower stall walls to have tile. Paint other walls with high performance coating.

4.0 Structural Systems Narrative

The structural systems narrative is intended to present structural systems data applicable to the renovations to the Shenandoah Community School District High School. It is not intended to provide a detailed description of the new structural systems, or to encompass all the work required to construct the new facilities according to any proposed plan. The following is a limited narrative of systems and materials that will be used to develop system design.

A. Structural Codes and Design

1. All structural systems for this facility will be designed in accordance with applicable codes as well as other industry recognized codes and standards. The applicable codes and standards include, but are not limited to, the following:

   a. International Building Code, 2015 Edition.
   b. American Concrete Institute, Building Code Requirements for Structural Concrete (ACI 318-14).
   c. American Society of Civil Engineers - Minimum Design Loads for Buildings and Other Structures (ASCE 7-10).
   d. American Institute of Steel Construction, Manual of Steel Construction (14th Edition).
   e. Masonry Standards Joint Committee – Building Code Requirements and Specifications for Masonry Structures, 2013 Edition (TMS 602-13/ACI 530.1-13/ASCE 6-13)
   f. American Institute of Steel Industry, Cold Formed Steel Design Manual, 2013 Edition (D100-13)

2. Design Loads

   a. Dead Loads

      1) Structure self-weight and superimposed dead loads, including MEP equipment

   b. Live Loads

      1) Roof = 25 psf
      2) Classrooms = 40 psf
      3) Corridors Above First floor = 80 psf
      4) Corridors / Stairs / Exitways = 100 psf
      5) Storage Rooms = 125 psf
      6) Mechanical / Electrical Rooms = 125 psf
      7) Partitions = 15 psf

   c. Wind Loads

      1) Basic Wind Speed: 120 mph
      2) Risk Category III, I_w = 1.00
      3) Exposure C

d. Seismic Loads

1) Site Classification D (assumed)
2) Risk Category III, I_e = 1.25
3) S_S = 0.093 g
4) S_1 = 0.048 g
5) S_{DS} = 0.100 g
6) S_{D1} = 0.077 g
7) Seismic Design Category B

e. Roof Snow Loads

1) Ground Snow Load, p_g = 20 psf
2) Risk Category III, I_s = 1.10
3) C_e = 1.0
4) C_t = 1.0
5) Roof Snow Load, p_f = 22 psf

B. Structural Framing and Foundation Systems

1. At areas where new rooftop units are to be installed, the existing roof structure will need to be analyzed. Either new joists will need to be brought in to support the new load, or the existing joist webs, flanges, and bearing shoes will need to be reinforced.
2. At new openings in existing CMU walls, new steel lintels will need to be provided.

5.0 Mechanical Design Narrative

A. Applicable Codes:

1. All mechanical systems for this facility will be designed in accordance with applicable codes as well as other industry recognized codes and standards. The applicable codes and standards include, but are not limited to, the following:

   a. AMCA – Air Movement and Control Association International, Inc.
   b. ANSI – American National Standards Institute.
   c. ARI – Air Conditioning and Refrigeration Institute.
   d. ASHRAE – American Society of Heating, Refrigerating, and Air Conditioning Engineers.
   e. ASME – American Society of Mechanical Engineers.
   f. ASSE – American Society of Sanitary Engineering.
   g. ASTM – American Society for Testing and Materials.
   h. AWS – American Welding Society.
   i. AWWA – American Water Work Association.
   j. CISPI – Cast Iron Soil Pipe Institute.
   k. EPA – Environmental Protection Agency.
   l. NEMA – National Electrical Manufacturer's Association.
   m. NFPA – National Fire Protection Association.
   n. NFPA 13 – Installation of Sprinkler Systems.
   o. NFPA 14 – Installation of Standpipe and Hose Systems.
   p. NFPA 90A – Air Conditioning and Ventilating Systems.
   q. NSF – National Sanitation Foundation.
   r. SMACNA – Sheet Metal and Air Conditioning Contractors' National Association.
   s. Fire and Smoke Damper Installation Guide.
   t. Standards for Duct Construction.
   u. UL – Underwriters' Laboratories.

2. Owner Requirements and Specific Codes:

   a. Owner Program Requirements (OPR)
   b. International Building Code 2015
   c. National Electric Code 2017
   d. IECC 2012
   e. 2015 Uniform Plumbing Code & Iowa Administrative Code 641-25
   f. 2015 International Mechanical Code
   g. 2015 International Fire Code

B. Design Criteria

1. Outdoor Design Conditions:

   a. Cooling: 97°F DB / 80°F WB (ASHRAE 0.4%)
   b. Heating: -10°F DB (ASHRAE 99.6)

2. Indoor Design Conditions: 75°F / 50% RH Summer, 70°F Winter. There is no plan to provide humidification in winter to maintain RH levels.
3. Outdoor air and exhaust air requirements shall be as per International Mechanical Code 2015 edition. (Auditorium and Gymnasium are excluded from the scope)
4. Occupant Loads: (per current ASHRAE Fundamentals Standard)

    a. Sensible: 250 Btu*h
    b. Latent: 200 Btu*h

C. General Mechanical Systems Design

1. Air Handling Units are assumed to be of modular construction.
2. It is assumed that the Air Handling Unit Fans will be internally isolated. Have assumed that external vibration isolation will not be required.
3. Air Handling Units and ductwork will be designed with the intent to reduce the size of and need for sound attenuators.
4. Sheet metal ductwork to be constructed to 2" w.c. pressure class (positive or negative as applicable),
5. Ductwork will be sized according to the following criteria;

    a. 0.10" per 100' static pressure loss and/or 1500 fpm for low pressure supply ductwork (1200 fpm for branch duct)
    b. 0.08" per 100' static pressure loss and/or 1500 fpm for exhaust ductwork
    c. 0.075" per 100' static pressure loss and/or 1000 fpm for return ductwork
    d. 0.35" per 100' static pressure loss and/or 2500 fpm for medium pressure supply ductwork downstream of VAV AHU's

6. Mechanical insulation assumed to be in accordance with the following summary;

Service	***Size***	***Thickness***
Refrigerant Piping	all sizes	½" armaflex
Outside Air Ductwork	all sizes	2" fiberglass
Supply Air Ductwork; exposed in conditioned space	all sizes	none
Supply Air Ductwork; concealed	all sizes	*1 ½"* fiberglass
Return Air Ductwork in plenum	all sizes	none
Return Air Ductwork in unconditioned space	all sizes	*1 ½"* fiberglass
Exhaust Ductwork	all sizes	*1 ½"* fiberglass (10' from exterior penetration)
Cold Equipment		¾" armaflex
Hot Equipment		2" fiberglass
Relief Air Ductwork	all sizes	*1 ½"* fiberglass (10' from exterior penetration)

7. Exposed supply ductwork that is not externally insulated will be double-wall spiral.
8. Paint for exposed ductwork assumed to be a flat paint.
9. Allowance for seismic bracing of HVAC System components is not anticipated and has not been included.
10. Grilles, Registers, and Diffusers will typically be industry standard of steel construction.
11. Air-Cooled Scroll Chillers will supply chilled-water for the building.
12. High-efficiency Condensing Boilers assumed to be supplying the heating hot water for the building.
13. Hydronic piping to be ASTM A 53/A 53M, black steel.
14. Hydronic piping assumed to be sized at a maximum pressure drop of 4" per 100' of pipe with a maximum velocity of 6 fps.
15. Chilled water and hot water pumps will be provided with variable speed drives.

D. Existing Building

1. HVAC Controls

    a. Provide new control elements to replace outdated modules.
    b. Provide new thermostats and CO2 sensors in each classroom and/or unit ventilator location.

        1) Controls shall be modified for a demand control ventilation sequence.

2. Unit Ventilators shall be recommissioned for proper operation.

    a. The damper shall be balanced and set for the minimum OA requirements for the room (.06 CFM per square foot of space).

3. Central Plant Equipment

    a. 200-ton air-cooled chiller to replace existing units.
    b. (2) 400 GPM Chilled Water Pumps & VFDs
    c. (2) 3000 MBH Condensing Boilers to replace existing units.
    d. (2) 200 GPM Hot Water Pumps & VFDs

4. Locker Rooms
    a. New exhaust and makeup air shall be provided

        1) 0.5 CFM/sqft

5. Existing Industrial Arts Classrooms

        1) NO WORK TO BE PERFORMED IN THIS AREA.

E. Renovation Alternatives

1. Science Rooms

a. Provide new exhaust fans for both the Chemistry and Biology classrooms; replacing the existing exhaust fans.
b. No dedicated make-up air handler will be provided: **Classrooms will continue to pull make-up air from the surrounding areas.**

F. Plumbing

1. Restrooms: Water closets shall be shall be vitreous china, high efficiency (1.28 gallons per flush) toilets. Urinals shall be vitreous china, high efficiency, requiring only 0.5 gallon per flush. Lavatories shall be vitreous china with high efficiency 0.5 GPM flow rate faucets. Sensor flush valves will be provided for all water closets, urinals, and lavatories.
2. Floor Drains: Floor drains will be connected to the gravity sanitary sewer system.

6.0 Electrical Systems Design

Narrative based on current best practices, and budget. Owner meetings are required to confirm design during design development

A. General Requirements

1. Electrical work and installations shall be in accordance with NFPA-70, “National Electrical Code”, NFPA-72 “National Fire Alarm Code”, NFPA-101 “Life Safety Code” and all local Codes and regulations. Telephone/Data network systems infrastructure shall comply with EIA/TIA Standards.

B. Electrical Power Distribution System

1. 10-12 new panels will replace the existing panels that have reached or are near end of life. New feeders to the panels will be replaced. Existing conduit may be used if it meets code.
2. All wiring shall be through EMT. Connections to all mechanical units shall be through liquid tight flexible conduit.

C. Lightning Protection System

1. A lightning protection system will not be provided.

D. Wiring Devices

1. General purpose receptacles will be added, (2) per classroom where needed and (2) at each bench location in corridors. Color of devices will be gray with brushed stainless steel cover plate.

E. Lighting

1. Illumination levels will be designed to comply with the standards contained in the latest edition of the Illumination Engineering Society (IES).

a.	Classrooms:	45 footcandles
a.	Offices:	45 footcandles
b.	Mechanical and electrical rooms:	30 footcandles
c.	Restrooms and support spaces:	20 footcandles

2. Luminaire types:

a. Exterior: all fixtures shall be LED type. Fixtures will be mounted on the building to provide illumination for entrances and to highlight specific design elements.
b. Interior: all fixtures shall be LED type. Recessed troffers shall be utilized throughout classrooms and offices.

3. Control: Lighting controls will be installed to comply with ASHRAE standard 90.1.

a. Classrooms will contain multiple zones of lights, with dimming switches. The row of fixtures adjacent to the teaching wall will be dimmed independently for A/V presentations. Occupancy sensors will be provided as the method of automatic shutoff throughout.
b. Small offices and storage rooms will be controlled by a switch with a built in occupancy sensor.
c. Corridors will be controlled with push button switches located in areas selected by Owner and connected to relays for automatic off.
d. Basis of design lighting control system shall be nLight, with Wattstopper DLM and Hubbell SpectraSync as alternate manufacturers

4. Lighting control relays will control all exterior lighting. Fixtures will be connected to emergency power as needed to meet exterior emergency lighting requirements.

F. Special Systems

1. Fire Alarm: The existing fire alarm system will be utilized for the renovated areas. The current fire alarm system is new and it is anticipated to reuse as much as possible in any renovated spaces. The existing system is assumed to be providing visual and audible emergency notification devices placed throughout the building in accordance with NFPA 72 and will be ADA compliant.

a. Notification appliances shall be ceiling mounted.

2. Voice, Data and Video Communications: The current design will provide communications rough-ins, pathways, cable trays, sleeves, ductbanks and other infrastructure components. Plans will provide for data cabling in locations as directed by the Owner.

a. Typical drop to be composed of a large backbox with a two-gang opening and (1) 1-¼" conduit to accessible ceiling spaces for communications cabling. All infrastructure will comply with EIA/TIA 568A and NFPA 72.
b. Data cabling will be provided for wireless access points, access control equipment and security cameras. Wireless access points will be provided by Owner.
c. Structured communications cabling including high speed data cabling, racks, jack panels, and cable management will be provided. Cabling will be a CAT 6A rated data solution. Combinations of cable trays, ductbanks and sleeves will provide internal interconnection of these spaces.

3. Intercom/Program Bell System: The new system will be composed of both cone and horn type loudspeakers zoned by classroom and by functional general areas. The system will be designed to integrate with the phone system and will include audio control relays, Master synchronized time clock, scheduled tone generator, and music distribution capability. Classroom telephones connected to the Owner furnish VOIP system will provide communications.
4. Clock System: The existing clock system will be expanded to serve the new additions. All clocks will be analog.
5. Door Access Control: Access control will be added at the existing doors by the public entry to the Auditorium.

G. Renovation Scope

1. Replace lighting in all spaces except where already retrofit to LED (the auditorium, tornado safe room, and gymnasium).
2. Replace emergency and exit lighting throughout and add as required.
3. Install energy code compliant lighting controls throughout all areas with new lighting.
4. Remove abandoned low voltage cabling throughout the building.
5. Install new data cabling with dedicated communications rooms containing cooling throughout the building.
6. Add two convenience receptacles in each classroom.
7. Replace intercom system.
8. New data cabling and racks. (reuse existing wireless access points).

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

EPANL LED

1'x4', 2'x2', and 2'x4'

FEATURES & SPECIFICATIONS

INTENDED USE — The EPANL Series LED Edge-Lit Flat Panel provides a fully luminous appearance across the face of the lens. This provides a soft, glare-free solution that is visually comfortable within the space. Suitable for many lighting applications including schools, offices and other commercial spaces, retail, convenience stores, hospitals and healthcare facilities. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.

CONSTRUCTION — Built to last with an aluminum frame for strength and durability, the seamless frame prevents light leak in the corners. The satin white lens provides excellent shielding and fully luminous appearance. EPANL's low-profile design provides increased installation flexibility especially in restricted plenum spaces. The back plate includes integral T-bar clips for installation into 15/16" T-grid ceilings. Clips for 9/16" T grid installation are available. See Accessories section on bottom of page. This must be ordered as a separate item. Fixture may be mounted and wired in continuous rows.

CONTROLS — Optional integrated nLight®controls make each luminaire addressable - allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Connection to nLight is simple. It can be accomplished with integrated nLight AIR wireless or through standard Cat-5 cabling. nLight offers unique plug-and-play convenience as devices and luminaires automatically discover each other and self-commission, while nLight AIR is commissioned easily through an intuitive mobile app.

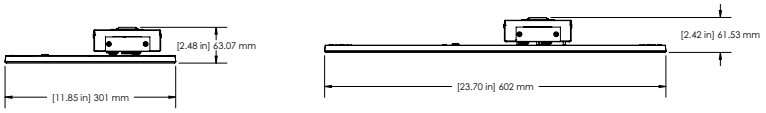
ELECTRICAL — Long-life LEDs, coupled with a high-efficiency driver, provide superior illumination for extended service life. High Efficiency EPANL maintains 97.7% of lumens at 60,000 hours (L97/60,000). 0-10V dimming driver, dims to 1% or 10% and contains non-isolated dimming leads.

LISTINGS — CSA certified to meet US and Canadian standards. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified. Intended for indoor use only. Damp location listed. IC rated. IP5X rated.

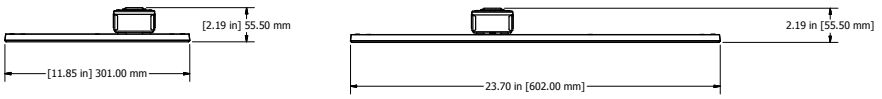
WARRANTY — 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Configurable fixture dimension



Stock fixture dimension



ORDERING INFORMATION Lead times will vary depending on options selected.

Example: EPANL 2X4 4000LM 80CRI 35K MIN1 MVOLT E10WCP NLTAIR2 RIO

Series	Width and Length	Lumens		CRI	Color Temperature	Minimum Dimming Level[1]
		Standard Lumens:	High Efficiency Lumens:			
EPANL LED Flat Panel	1x4 1'x4'	1500LM 1500 Lumens 3000LM 3000 Lumens 4000LM 4000 Lumens 4800LM 4800 Lumens 6000LM 6000 Lumens	4000LMHE 4000 Lumens	80CRI 80 CRI	35K 3500K 40K 4000K 50K 5000K	MIN10 Dims to 10%[2] MIN1 Dims to 1%
	2x2 2'x2'	2000LM 2000 Lumens 3400LM 3400 Lumens 4000LM 4000 Lumens 4800LM 4800 Lumens	3400LMHE 3400 Lumens			
	2x4 2'x4'	3000LM 3000 Lumens 4000LM 4000 Lumens 4800LM 4800 Lumens 5400LM 5400 Lumens 6000LM 6000 Lumens 6800LM 6800 Lumens	4000LMHE 4000 Lumens			

Ordering continued on next page.

ORDERING (continued)

Control Input[3]	Voltage	Step Level Dimming	Emergency Option	nLight Interface	Control
ZT Generic 0-10V Dimming	MVOLT 120-277V	(Blank) None	E10WCP EM Self-Diagnostic battery pack, 10W Constant Power, Certified in CA Title 20 MAEDBS[7,8,9]	nLight Wired:[12]	nLight Wired:[12]
EZT eldoLED 0-10V Dimming	120 120V	SLD Step Level Dimming[5,6]	BGTD Bodine Generator Transfer Device[10]	(blank) No constant lumen management	(blank) no control
NLIGHT nLight enabled (Wired)	277 277V		EMG for use with nLight on generator supply EM power[11]	CL80 Constant lumen output 80%	
	347 347V[4]			nLight Wireless:	nLight Wireless:
				NLTAIR2 nLight AIR Generation 2 enabled[13]	RIO nLight AIR Radio module

Options			
GLR	Fast-blowing fuse[14]	PWS1856LV	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit w/low voltage purple and grey wires[14]
GMF	Slow-blowing fuse[14]	CP	Chicago plenum[16]
PWS1836	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit	RRL_	RELOC®-ready luminaire
PWS1846	6' pre-wire, 3/8" diameter, 18 gauge, 2 circuit	NPLT	Narrow Pallet
PWS1846 PWSLV	Two cables: one 6' pre-wire, 3/8" diameter, 18 gauge, 2 circuits; one 6' pre-wire, 3/8" diameter, 18 gauge, purple and gray[15]		

Notes:
1. If Step Level Dimming (SLD) is needed please leave this section blank.
2. Not available with EZT or NLIGHT.
3. If Step Level Dimming (SLD) or NLTAIR2 is needed please leave this section blank.
4. Not available with EZT, NLIGHT, SLD, Emergency options or Controls.
5. Not available with BGTD.
6. When using prewire option use PWS1846.
7. When using prewire option use PWS1846 or PWS1846 PWSLV.
8. Please refer to Emergency Battery Estimated Lumen section for lumen estimation. PS1055CP installed with lumen packages > 6000. PS1055CP installed with lumen packages < 5400.
9. Not available with NLTAIR2 RIO in the 2X2 4800LM and 1X4 or 2X4 6000LM and 6800LM.
10. Requires BSE labeling, voltage must be specified (120, 277). Consult factory for options. Example: BGTD BSE10.
11. nLight EMG option requires a conection to existing nLight network. Power is provided from a separate nLight enabled fixture. Requires NLIGHT.
12. Requires NLIGHT control input.
13. Only available with MIN1 Minimum Dimming Level option.
14. Voltage must be specified (120, 277, 347).
15. Not available with nLight Wired / nLight Wireless
16. Not available with NLIGHT or NLTAIR2 RIO.

Stock Configurations available for shorter lead times:

ORDERING INFORMATION

Catalog Number	UPC	Description	Lumens	Color Temperature	CRI	Voltage	Wattage	Efficacy	Pallet Qty.	DLC Product ID	Standard Carton Qty.
EPANL 14 40L 35K	190887602739	1x4 Flat Panel	3905	3500K	>80	120-277V	38.6W	101	26	P2EP2UU2	1
EPANL 14 40LHE 35K	190887602746	1x4 Flat Panel	3922	3500K	>80	120-277V	30.6W	128	26	PW4EWKTF	1
EPANL 14 40L 40K	190887602753	1x4 Flat Panel	4397	4000K	>80	120-277V	38.5W	114	26	PSDQ2435	1
EPANL 14 40LHE 40K	190887602760	1x4 Flat Panel	3857	4000K	>80	120-277V	30.2W	128	26	PYVHJHHA	1
EPANL 14 40L 50K	191723811605	1X4 Flat Panel	4225	5000K	>80	120-277V	38.6W	113	26	PQRR9J9D	1
EPANL 22 34L 35K	190887602647	2x2 Flat Panel	3285	3500K	>80	120-277V	31.3W	105	52	PSJAMM3U	1
EPANL 22 34LHE 35K	190887602661	2x2 Flat Panel	3357	3500K	>80	120-277V	26.0W	129	52	P4A3BZHM	1
EPANL 22 34L 40K	190887602678	2x2 Flat Panel	3479	4000K	>80	120-277V	30.8W	113	52	PPEMCYR8	1
EPANL 22 34LHE 40K	190887602685	2x2 Flat Panel	3361	4000K	>80	120-277V	25.9W	130	52	P8CTRGQ2	1
EPANL 22 34L 50K	191723811650	2x2 Flat Panel	3385	5000K	>80	120-277V	32.9W	102	52	PID80U18	1
EPANL 24 40L 35K	190887602692	2x4 Flat Panel	4039	3500K	>80	120-277V	38.8W	104	26	PMCKJFQQ	1
EPANL 24 40LHE 35K	190887602708	2x4 Flat Panel	3953	3500K	>80	120-277V	30.3W	130	26	PTBTGX3F	1
EPANL 24 40L 40K	190887602715	2x4 Flat Panel	4351	4000K	>80	120-277V	38.9W	112	26	PJKBRVAZ	1
EPANL 24 40LHE 40K	190887602722	2x4 Flat Panel	4013	4000K	>80	120-277V	30.7W	131	26	P1FS4WBQ	1
EPANL 24 40L 50K	191723812312	2X4 Flat Panel	4108	5000K	>80	120-277V	39W	105	26	PELRMDH9	1

EPANL LED Flat Panel

Performance Data					
Model No.	**CCT**	**Lumens**	**Wattage**	**LPW**	**DLC Product ID**
EPANL 1X4 1500LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277] [ALL OPTIONS]	3500	1455	13	110	P8VKRLEE
EPANL 1X4 1500LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	1455	12	119	P7KC755F
EPANL 1X4 1500LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277] [ALL OPTIONS]	4000	1518	13	115	PJAPOIUK
EPANL 1X4 1500LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	1518	12	124	P93PN6HF
EPANL 1X4 1500LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277] [ALL OPTIONS]	5000	1527	13	115	PJ2LT8RF
EPANL 1X4 1500LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	1527	12	125	PM020WDF
EPANL 1X4 3000LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	2885	27	106	PBMBSQA8
EPANL 1X4 3000LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	2885	26	112	PT0HAAX5
EPANL 1X4 3000LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	3009	27	110	PNKUCIIA
EPANL 1X4 3000LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	3009	26	116	P53ZWBUF
EPANL 1X4 3000LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	3028	27	111	PMHI2SAT
EPANL 1X4 3000LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	3028	26	117	PFZRHIYS
EPANL 1X4 4000LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	4025	39	104	PB2IF8PG
EPANL 1X4 4000LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	4025	38	106	PI0B3Q4S
EPANL 1X4 4000LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	4198	39	109	P7MFGP4R
EPANL 1X4 4000LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	4198	38	110	PQH0HMOH
EPANL 1X4 4000LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	4225	39	110	PY8MM627
EPANL 1X4 4000LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	4225	38	111	P3XBCGJO
EPANL 1X4 4800LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	4765	47	101	P7I6D3WI
EPANL 1X4 4800LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	4765	46	103	PJ87LC64
EPANL 1X4 4800LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	4970	47	106	PICJQWDG
EPANL 1X4 4800LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	4970	46	107	PZW1PDFZ
EPANL 1X4 4800LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	5002	47	107	PQAFPPJ6
EPANL 1X4 4800LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	5002	46	108	PCNBYZM0
EPANL 1X4 6000LM 80CRI 35K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	5804	50	117	P31GEZNP
EPANL 1x4 6000LM 80CRI 35K [MVOLT, 120, 277] SLD [ALL OPTIONS]	3500	5804	50	117	P9MS2F1Z
EPANL 1X4 6000LM 80CRI 40K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	5976	50	120	PEC0ZVXY
EPANL 1x4 6000LM 80CRI 40K [MVOLT, 120, 277] SLD [ALL OPTIONS]	4000	5976	50	120	PRC6VIDH
EPANL 1X4 6000LM 80CRI 50K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	6028	50	121	PSBGKZ54
EPANL 1x4 6000LM 80CRI 50K [MVOLT, 120, 277] SLD [ALL OPTIONS]	5000	6028	50	121	PEVMDG8B
EPANL 2X2 2000LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	1946	19	103	P4AJOGI1
EPANL 2X2 2000LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	1946	17	112	P4YZ508D
EPANL 2X2 2000LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	2030	20	104	PIQUALNF
EPANL 2X2 2000LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	2030	17	117	PULQ3DQ4
EPANL 2X2 2000LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	2043	20	104	P167DCJS
EPANL 2X2 2000LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	2043	17	118	P1FNCFUQ
EPANL 2X2 3400LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	3225	32	100	PMKTPCS2
EPANL 2X2 3400LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	3225	31	103	PB1DW61J
EPANL 2X2 3400LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	3364	33	102	PWRHGEH4
EPANL 2X2 3400LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	3364	31	108	PG7KB5GU
EPANL 2X2 3400LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	3385	33	103	PL6024K5
EPANL 2X2 3400LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	3385	31	109	PP79GBQH
EPANL 2X2 4000LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	4025	32	125	PVNFV904
EPANL 2X2 4000LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	4025	32	127	PG3TFG09
EPANL 2X2 4000LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	4144	32	129	P5L7HREA
EPANL 2X2 4000LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	4144	32	131	PPZPR06A
EPANL 2X2 4000LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	4180	32	130	P94H4XFG
EPANL 2X2 4000LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	4180	32	132	PFQ0F3LM
EPANL 2X2 4800LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	4446	36	123	PUWKT05O
EPANL 2X2 4800LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	4446	36	125	P76FQ6V1
EPANL 2X2 4800LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	4578	36	126	P0OY8NZ2
EPANL 2X2 4800LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	4578	36	128	PB9V8XNL
EPANL 2X2 4800LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	4618	36	127	PW2SY5X9
EPANL 2X2 4800LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	4618	36	129	PAAAM27H
EPANL 2X4 3000LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	2993	27	109	PVIRSOQB
EPANL 2X4 3000LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	2993	26	115	PWJKJ91G
EPANL 2X4 3000LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	3122	27	114	PU32L41S
EPANL 2X4 3000LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	3122	26	120	PPQP99LT
EPANL 2X4 3000LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	3142	27	115	P4H3UGFQ
EPANL 2X4 3000LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	3142	26	121	PLI4CPSN
EPANL 2X4 4000LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	3914	39	100	PPTL71HY
EPANL 2X4 4000LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	3914	38	102	PR02E004
EPANL 2X4 4000LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	4082	39	105	PT1H08CF
EPANL 2X4 4000LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	4082	38	106	PGSERWDA
EPANL 2X4 4000LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	4108	39	105	P8TD4A4V
EPANL 2X4 4000LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	4108	38	107	PTXVJN0I
EPANL 2X4 4800LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	4771	47	101	P4PIGUFW
EPANL 2X4 4800LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	4771	46	103	PI2A3L85
EPANL 2X4 4800LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	4976	47	106	P4SKVRJP
EPANL 2X4 4800LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	4976	46	107	P018HM99
EPANL 2X4 4800LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	5008	47	106	PG2MHOZE
EPANL 2X4 4800LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	5008	46	108	PWTSOASQ
EPANL 2X4 5400LM 80CRI 35K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	5143	51	100	PFCL13O0
EPANL 2X4 5400LM 80CRI 35K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	3500	5143	51	100	PK7Q1VHH
EPANL 2X4 5400LM 80CRI 40K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	5296	52	102	PR3K6SHH
EPANL 2X4 5400LM 80CRI 40K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	4000	5296	51	103	P8KYWF8W
EPANL 2X4 5400LM 80CRI 50K [MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	5341	52	102	PVKKX9GJ
EPANL 2X4 5400LM 80CRI 50K [MVOLT, 120V, 277V] SLD [ALL OPTIONS]	5000	5341	51	104	PX1YH6FH
EPANL 2X4 6000LM 80CRI 35K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	6369	54	118	PSV3OWTM
EPANL 2x4 6000LM 80CRI 35K [MVOLT, 120, 277] SLD [ALL OPTIONS]	3500	6369	54	118	P0K7S9Q3
EPANL 2X4 6000LM 80CRI 40K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	6558	54	122	PWVK6LER
EPANL 2x4 6000LM 80CRI 40K [MVOLT, 120, 277] SLD [ALL OPTIONS]	4000	6558	54	122	PHICR0VH
EPANL 2X4 6000LM 80CRI 50K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	6615	54	123	PQMRLFRM
EPANL 2x4 6000LM 80CRI 50K [MVOLT, 120, 277] SLD [ALL OPTIONS]	5000	6615	54	123	PSF8NN00
EPANL 2X4 6800LM 80CRI 35K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	3500	6645	60	111	PW004OLR
EPANL 2x4 6800LM 80CRI 35K [MVOLT, 120, 277] SLD [ALL OPTIONS]	3500	6645	60	111	P7ALFH3K
EPANL 2X4 6800LM 80CRI 40K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	4000	6842	60	114	P8FFEBQH
EPANL 2x4 6800LM 80CRI 40K [MVOLT, 120, 277] SLD [ALL OPTIONS]	4000	6842	60	114	PIUM942B
EPANL 2X4 6800LM 80CRI 50K [BLANK, MIN1, MIN10] [BLANK, ZT, EZT, NLIGHT] [MVOLT, 120, 277, 347] [ALL OPTIONS]	5000	6901	60	115	PCMK605N
EPANL 2x4 6800LM 80CRI 50K [MVOLT, 120, 277] SLD [ALL OPTIONS]	5000	6901	60	115	P9AP1VBW

ACCESSORIES

Accessories: *Order as separate catalog number.*

DGA14	Drywall grid adapter for 1x4 recessed fixture.
DGA22	Drywall grid adapter for 2x2 recessed fixture.
DGA24	Drywall grid adapter for 2x4 recessed fixture.
PS1055CP FMC BRKT	Power Sentry emergency constant power battery pack field installation kit for Certified in CA Title 20 MAEDBS.[1]
2X2SMKSH	2'x2' Surface Mount Troffer Kit[1]
2X4SMKSH	2'x4' Surface Mount Troffer Kit[1]
1X4SMKSH	1'x4' Surface Mount Troffer Kit[1]
EPANL TGRID CLIP J4	Pack of 4 grid clips for 9/16" T grid compatibility.
EPANL TGRID CLIP J50	Pack of 50 grid clips for 9/16" T grid compatibility.
1X4PANLACG 36	Adjustable aircraft cable gripper suspension kit with 36" length cables for 1X4 fixture. Includes: suspension cables, mounting hardware, and 5 wire power feed cable (Ground, Hot, Neutral, and Low Voltage Leads).[2]
1X4PANLACG 72	Adjustable aircraft cable gripper suspension kit with 72" length cables for 1X4 fixture. Includes: suspension cables, mounting hardware, and 5 wire power feed cable (Ground, Hot, Neutral, and Low Voltage Leads).[2]
2X2PANLACG 36	Adjustable aircraft cable gripper suspension kit with 36" length cables for 2X2 fixture. Includes: suspension cables, mounting hardware, and 5 wire power feed cable (Ground, Hot, Neutral, and Low Voltage Leads).[2]
2X2PANLACG 72	Adjustable aircraft cable gripper suspension kit with 72" length cables for 2X2 fixture. Includes: suspension cables, mounting hardware, and 5 wire power feed cable (Ground, Hot, Neutral, and Low Voltage Leads).[2]
2X4PANLACG 36	Adjustable aircraft cable gripper suspension kit with 36" length cables for 2X4 fixture. Includes: suspension cables, mounting hardware, and 5 wire power feed cable (Ground, Hot, Neutral, and Low Voltage Leads).[2]
2X4PANLACG 72	Adjustable aircraft cable gripper suspension kit with 72" length cables for 2X4 fixture. Includes: suspension cables, mounting hardware, and 5 wire power feed cable (Ground, Hot, Neutral, and Low Voltage Leads).[2]

Emergency Battery Estimated Lumens

Use the formula below to estimate the delivered lumens in emergency mode

Estimated Lumens = 1.25 x P x LPW

P = Output power of emergency driver (10W for PS1055CP)

LPW = Lumen per watt rating of the luminaire.

SMKSH Accessory

Notes:
1. Cannot be installed with fixture with integrated NLTAIR2 RIO.
2. See Suspension Kits section on bottom of page 6 for additional detail.

nLight® Wired Control Accessories:
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight.

WallPod stations	**Model number**	**Occupancy sensors**	**Model number**
On/Off	nPODM [color]	Small motion 360°, ceiling (PIR / dual tech)	nCM 9 RJB / nCM PDT 9 RJB
On/Off & raise/lower	nPODM DX [color]	Large motion 360°, ceiling (PIR / dual tech)	nCM10 RJB / nCM PDT 10 RJB
Graphic touchscreen	nPOD GFX [color]	Wall switch with raise/lower	nWSX PDT LV DX [color]
Photocell controls	**Model number**	**Cat-5 cable (plenum rated)**	**Model number**
Full range dimming	nCM ADCX RJB	10' cable	CAT5 10FT J1
		30' cable	CAT5 30FT J1

nLight® AIR Control Accessories:
Order as separate catalog number.
Visit www.acuitybrands.com/products/controls/nlightair.

Wall switches	**Model number**
On/Off single pole	rPODB [color] G2
On/Off two pole	rPODB 2P [color] G2
On/Off & raise/lower single pole	rPODB DX [color] G2
On/Off & raise/lower two pole	rPODB 2P DX [color] G2
On/Off & raise/lower single pole	rPODBZ DX WH G2

rCMS[1] — **Example: RCMS PDT 10 AR G2**

Series / Detection	**Power Supply[1]**	**Occupancy Detection**	**Lens (Required)**	**Operating Mode**	**Generation**
RCMS nLight AIR occupancy and daylight sensor	[blank] Power Supply ordered separately	[blank] PIR Detection	10 Large Motion/ Extended Range 360°	[BLANK] None	G2 Generation 2 compatibility
	PS 150 Standard 150 mA Power Supply	PDT Dual Tech PIR/ Microphonics	9 Small Motion/ Extended Range 360°	AR Auxiliary Relay	
			6 High Bay 360° Lens		

Notes
1 RCMS requires low voltage power from either RPP20 DS 24V G2 or PS150.

nLight AIR Wireless

nLight AIR is the ideal solution for retrofit or new construction spaces where adding additional wiring can be labor intensive and costly. The integrated RIO module is part of each luminaire in the nLight AIR network, which can be grouped to control multiple luminaires.

Simple as 1,2,3

1. Install the nLight® AIR fixtures with integrated RIO module.
2. Install the wireless battery-powered wall switch.
3. With CL*AIR*ITY PRO app, pair the fixtures with the wall switch and if desired, add and customize the ceiling mount sensor settings.

EPANL LED Flat Panel

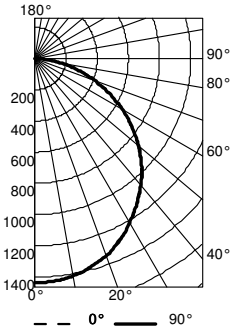
EPANL compatible with Sensor Switch™ WSX-D and SPOD wall switches.

WSX-D

SPOD

PHOTOMETRICS

EPANL 2x2 4000LM 80CRI 40K, 4144.5 delivered lumens.



CP Summary

	0°	90
0°	1433	1433
5°	1432	1431
15°	1385	1385
25°	1282	1285
35°	1136	1140
45°	964	968
55°	754	758
65°	529	528
75°	296	291
85°	85	80
90	4	3

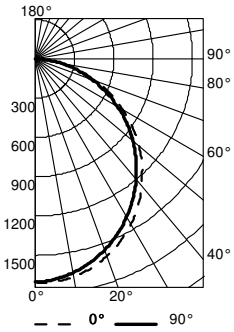
Coefficients of Utilization

	pf				20%							
	pc		80%			70%				50%		
	pw	70%	50%	30%		50%	30%	10%		50%	30%	10%
RCR	0	119	119	119		116	116	116		111	111	111
	1	108	104	99		101	97	94		97	94	91
	2	98	90	83		88	82	76		85	79	75
	3	90	79	71		77	70	63		74	68	62
	4	82	70	61		69	60	54		66	59	53
	5	75	62	53		61	53	46		59	52	46
	6	70	56	47		55	47	40		53	46	40
	7	65	51	42		50	42	36		48	41	35
	8	60	46	38		46	37	32		44	37	32
	9	56	43	34		42	34	29		41	34	28
	10	53	39	31		39	31	26		38	31	26

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1115	26.9	26.9
0° - 40°	1823	44.0	44.0
0° - 60°	3234	78.0	78.0
0° - 90°	4144	100.0	100.0
90° - 120°	1	0.0	0.0
90° - 130°	1	0.0	0.0
90° - 150°	1	0.0	0.0
90° - 180°	1	0.0	0.0
0° - 180°	4144	100.0	100.0

EPANL 2x4 4800LM 80CRI 40K, 4976.3 delivered lumens.



CP Summary

	0°	90
0°	1703	1703
5°	1707	1689
15°	1653	1610
25°	1535	1477
35°	1364	1300
45°	1154	1086
55°	903	851
65°	636	593
75°	354	335
85°	103	103
90	3	13

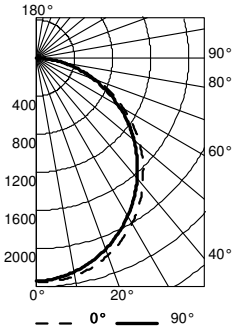
Coefficients of Utilization

	pf				20%							
	pc		80%			70%				50%		
	pw	70%	50%	30%		50%	30%	10%		50%	30%	10%
RCR	0	119	119	119		116	116	116		111	111	111
	1	108	103	99		101	97	93		97	94	91
	2	98	90	83		88	82	76		84	79	74
	3	90	79	70		77	69	63		74	68	62
	4	82	70	61		68	60	54		66	59	53
	5	75	62	53		61	52	46		59	51	46
	6	69	56	47		55	46	40		53	46	40
	7	64	51	42		50	41	35		48	41	35
	8	60	46	38		46	37	32		44	37	31
	9	56	42	34		42	34	28		41	33	28
	10	52	39	31		39	31	26		38	31	26

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1330	26.7	26.7
0° - 40°	2179	43.8	43.8
0° - 60°	3862	77.6	77.6
0° - 90°	4975	100.0	100.0
90° - 120°	1	0.0	0.0
90° - 130°	1	0.0	0.0
90° - 150°	1	0.0	0.0
90° - 180°	1	0.0	0.0
0° - 180°	4976	100.0	100.0

EPANL 2x4 6800LM 80CRI 40K, 6842.1 delivered lumens.



CP Summary

	0°	90
0°	2342	2342
5°	2347	2323
15°	2273	2214
25°	2111	2030
35°	1875	1788
45°	1586	1493
55°	1242	1170
65°	874	816
75°	487	461
85°	141	141
90	3	17

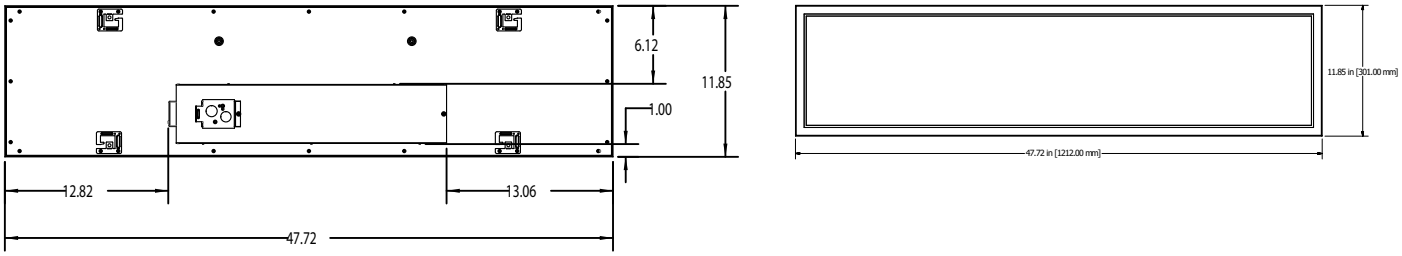
Coefficients of Utilization

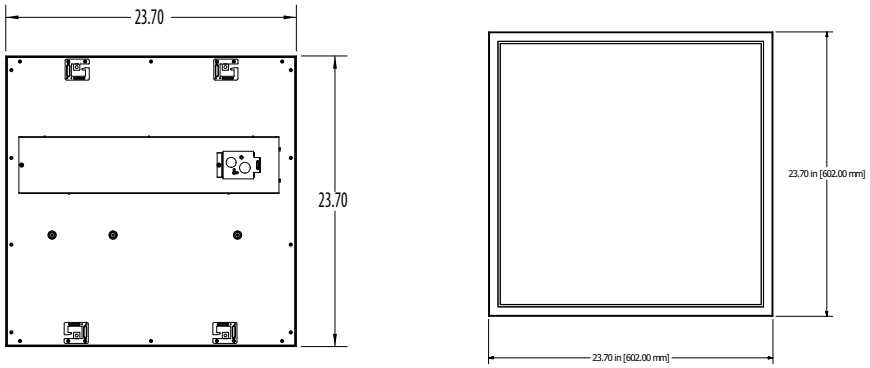
	pf				20%							
	pc		80%			70%				50%		
	pw	70%	50%	30%		50%	30%	10%		50%	30%	10%
RCR	0	119	119	119		116	116	116		111	111	111
	1	108	103	99		101	97	93		97	94	91
	2	98	90	83		88	82	76		84	79	74
	3	90	79	70		77	69	63		74	68	62
	4	82	70	61		68	60	54		66	59	53
	5	75	62	53		61	52	46		59	51	46
	6	69	56	47		55	46	40		53	46	40
	7	64	51	42		50	41	35		48	41	35
	8	60	46	38		46	37	32		44	37	31
	9	56	42	34		42	34	28		41	33	28
	10	52	39	31		39	31	26		38	31	26

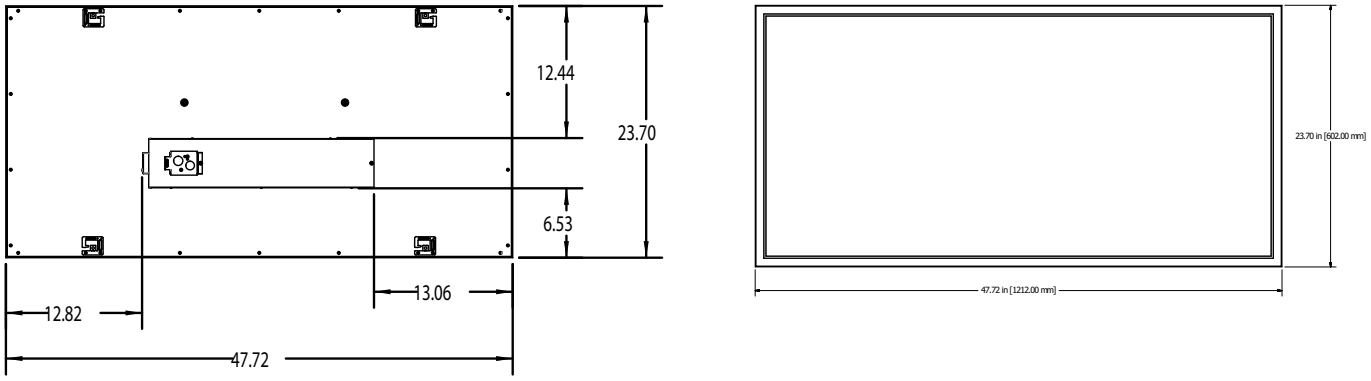
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1829	26.7	26.7
0° - 40°	2996	43.8	43.8
0° - 60°	5310	77.6	77.6
0° - 90°	6840	100.0	100.0
90° - 120°	1	0.0	0.0
90° - 130°	1	0.0	0.0
90° - 150°	1	0.0	0.0
90° - 180°	1	0.0	0.0
0° - 180°	6842	100.0	100.0

DIMENSIONS



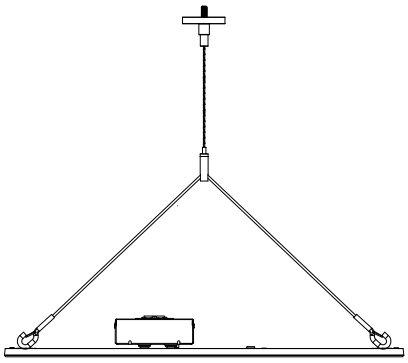




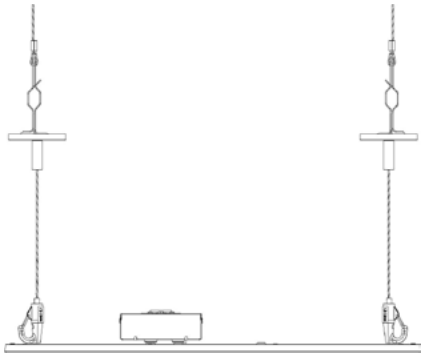
Suspension Kits

1X4PANLACG

2X2PANLACG

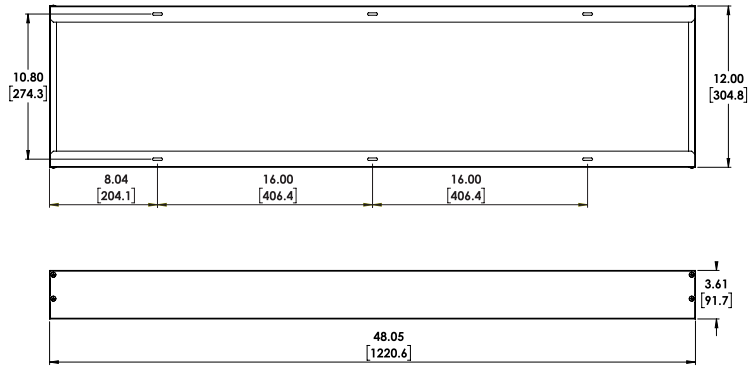


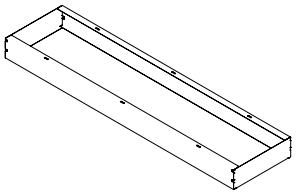
2X4PANLACG

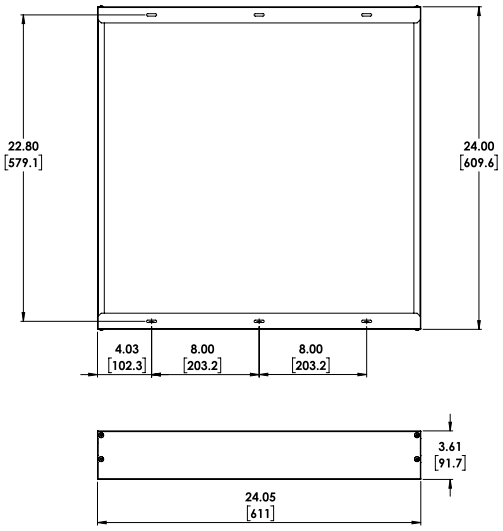


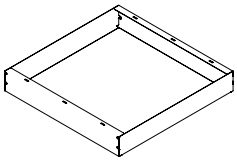
1X4SMKSH, 2X2SMKSH, 2X4SMKSH

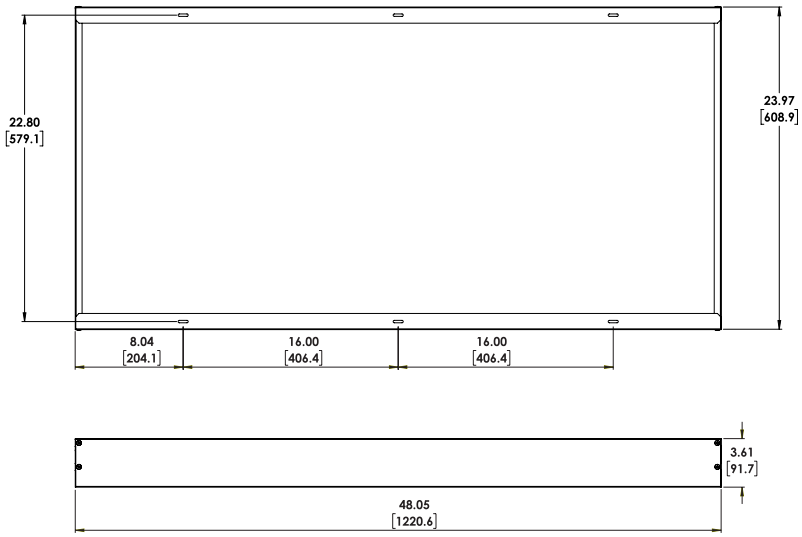
SURFACE MOUNT KIT - MOUNTING DATA

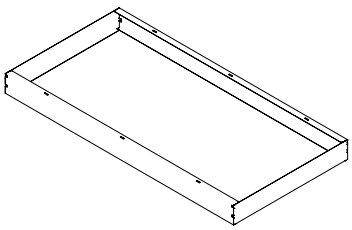












LUMINAIRES - LED TROFFER AR-TF2230BD

Product Description:

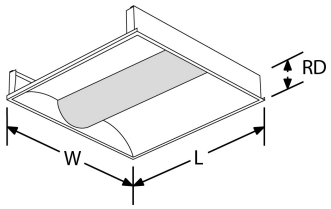
The VersiLite Troffer features high efficiency, quality and performance achieving up to 125lm/w. These luminaires are designed with the latest LED technology to produce highly efficient lighting, which provides pleasant and uniform light distribution. The VersiLite have a clean, modern look and an even distribution which makes them an ideal solution for either drop ceilings in offices, schools, hospitality and other commercial applications.

The Aurora Troffer offers lower power consumption, longer life, 0-10V dimming and zero maintenance (no re-lamping required) than the standard fluorescent fixture and are therefore an excellent energy efficient replacement. .

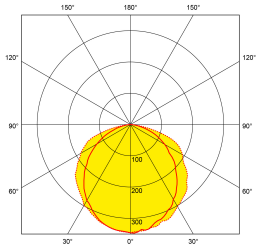
IES files available on the Aurora website.

Product Image:

Line Drawing



Polar Curve



Product Specs:

Technology	LED	Number of LEDs	192
Luminaire Distribution	Direct	Lifetime L70 (hrs)	50000
Input Voltage	100~277V AC	Input Frequency	60/60HZ
Dimmable	Yes	Fixed or Adjustable	Fixed
Dali	No	IP Rating	Damp Location
Fire Protection	No	Acoustic Rated	No
Operating Temp	104	Optic Material	PC
Power Factor	0.9	Width (Inches)	23.7
Length (Inches)	23.7	Recess Depth (Inches)	3.93
Height (Inches)	3.93	Material	Aluminium
Premium DLC Listing	Yes		

SKU Table and Ordering:

SKU Code	Wattage	Beam Angle	lm	Lumens/Watt	Colour	Ra
AR-TF2230BD/35	30	120	3750	125	3500	80
AR-TF2230BD/40	30	120	3750	125	4000	80
AR-TF2230BD/50	30	120	3750	125	5000	80

Compliance & Approvals:

Warranty:

This product has a warranty period of . Warranties may be available on certain products as indicated in the product description. Warranties are valid from the date of purchase.The warranty is invalid in the case of improper use, installation, tampering, removal of the Q.C. date label or installation in an improper working environment or installation. Should this product fail during the warranty period it will be replaced free of charge, subject to the correct installation of the original product and subsequent return of the faulty unit. Aurora does not accept responsibility for any installation costs associated with the replacement of this product and Aurora reserves the right to alter specifications without prior notice.

USA Sales & Distribution
12035 34th Street North
Suite 2
St Petersburg, Florida 33716
USA
Tel : +1 (727) 524 4270

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

FEATURES & SPECIFICATIONS

INTENDED USE — Built on the compact, low-profile Z strip channel, this LED strip offers long maintenance-free life, several color temperatures, lumen outputs and lengths. Ideal for new construction and retrofit applications in T8 lengths. Ideal for use in commercial, retail, manufacturing, warehouse, and display applications. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.

CONSTRUCTION — Compact-design channel and cover are formed from code-gauge cold-rolled steel. Easy to install six-point row aligner included for continuous row mounting.

Finish: Paint options include high-gloss, baked white enamel (WH), or matte black (MB). After fabrication, five-stage iron phosphate pre-treatment ensures superior paint adhesion and rust resistance.

OPTICS — Standard diffuse snap on/snap off lens eliminates pixels, improves uniformity and minimizes glare.

ELECTRICAL — Utilizes high-output LEDs integrated on a two-layer circuit board, ensuring cool-running operation. Optional internal pluggable wiring harness for reduced labor cost in row mounting applications (see PLR_ ordering information on page 3). Electronic LED driver is rated for 75 input watts maximum (see Operational Data on page two for actual wattage consumption), **multi-volt input and 0-10V dimming standard**. This fixture is designed to withstand a maximum line surge of 2.5kV at 0.75kA combination wave for indoor locations, for applications requiring higher level of protection additional surge protection must be provided.

LEDs provide 80CRI or 90 CRI at 3000 K, 3500 K,4000 K or 5000 K.

Lumen output up to 1,500 lumens per foot. Luminaire should be installed in applications where ambient temperatures do not exceed 86 °F (30 °C).

INSTALLATION — Fixture may be surface mounted (with or without ZSPRG hanger), pendant or stem mounted with appropriate mounting options. Six-point aligner locks in place for easy continuous row mounting.

LISTINGS — CSA certified to US and Canadian safety standards. For use in damp locations between -40 °F (-40 °C) and 86 °F (30 °C).

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/resources/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Z SERIES

LED Striplight

ZL1D

24", 48" and 96" Lengths

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® or XPoint™ Wireless control networks marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

ZL1D LED Striplight

A+ Capable options indicated by this color background.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: ZL1D L48 3000LM FST MVOLT 40K 80CRI WH

Series		Length		Reflectors[1]		Nominal lumens[2]		Diffuser		Voltage		Color temperature	
ZL1D	LED striplight	L24	24"	(blank)	Less reflector	1500LM	1,500 lumens	FST	Drop lens	MVOLT	120-277V	30K	3000 K
				SMR	Symmetric	2500LM	2,500 lumens			120	120V	35K	3500 K
						3500LM	3,500 lumens			208	208V	40K	4000 K
		L48	48"	(blank)	Less reflector	3000LM	3,000 lumens			240	240V	50K	5000 K
				ASR	Asymmetric	5000LM	5,000 lumens			277	277V		
				SMR	Symmetric	7000LM	7,000 lumens			347	347V[3]		
TZL1D	LED striplight	L96	96"	(blank)	Less reflector	6000LM	6,000 lumens			480	480V[3]		
				SMR	Symmetric	10000LM	10,000 lumens						
						14000LM	14,000 lumens						

Color rendering index		Options			Paint finish	
80CRI	80 CRI	PLR__	Plug-in wiring[4,5]	Cord sets:[10]	WH	White
90CRI	90 CRI	PLR1LVG	Plug-in wiring-low voltage[4,5]	CS1W	Straight plug, 120V	MB	Matte black
		E7W	Emergency battery pack, 7W CA Title 20 Noncompliant[6,7]	CS3W	Twist-lock, 120V	GALVB	Galvanized fixture with black plastic lens endcaps
		2E7W	Two Emergency battery packs, 7W CA Title 20 Noncompliant[6,7,8]	CS7W	Straight plug, 277V	GALVW	Galvanized fixture with white plastic lens endcaps
		E10WLCP	Emergency battery pack, 10W Linear Constant Power, Certified in CA Title 20 MAEDBS[6,7]	CS11W	Twist-lock, 277V		
		2E10WLCP	Two Emergency battery packs, 10W Linear Constant Power, Certified in CA Title 20 MAEDBS[6,7,8]	CS25W	Twist-lock, 347V		
		E15WLCP	Emergency battery pack, 15W Linear Constant Power, Certified in CA Title 20 MAEDBS[6,7,8]	CS97W	Twist-lock, 480V		
		OUTEND	Cord set to exit endplate of fixture	CS93W	600V SEOOW white cord, no plug (no voltage required)		
		LBOZU	360° low mount motion sensor, pre-wired[9]				
		LBH0SZU	360° low mount motion sensor with dimming, pre-wired[9]				
		LBPZU	360° low mount motion sensor with photocell, pre-wired[9]				
		LBM0SZU	360° low mount motion sensor, dimming & switching photocell, pre-wired[9]				

Accessories: *Order as separate catalog number.*

HC36	Hanger chain, 36"	ZLR L24 SYM WH	24" symmetric reflector, white finish
ZACVH	Aircraft cable 10' (one pair)	ZLR L46 SYM UPL WH	46" symmetric reflector with uplight, white finish
ZLANGBKT	Luma-tilt™ angle bracket for shelf or ledge mounting only	ZLR L46 SYM WH	46" symmetric reflector, white finish
SQ_	Stem kit, 2" increments up to 48"	ZLR L48 ASY WH	48" asymmetric reflector, white finish
NPP16D	nLight® switching/dimming module	ZLR L48 SYM UPL WH	48" symmetric reflector with uplight, white finish
rPP20D	nLight® Air switching/dimming module	ZLR L48 SYM WH	48" symmetric reflector, white finish
LSXR	Sensor Switch® LSXR occupancy sensor[4]	ZLR L92 SYM UPL WH	92" symmetric reflector with uplight, white finish
ZSPRG	For 15/16" T-grid only	ZLR L92 SYM WH	92" symmetric reflector, white finish
WGZ24	24" wireguard, white[11]	ZLR L96 SYM UPL WH	96" symmetric reflector with uplight, white finish
WGZ48	48" wireguard, white[11,12]	ZLR L96 SYM WH	96" symmetric reflector, white finish
ZLR L24 SYM UPL WH	24" symmetric reflector with uplight, white finish	UNIVERSAL REFL ALIGNER	Universal reflector aligners, quantity 1

Notes

1. Optional. Reflectors ship separately.
2. See Operational Data on page 2 for actual lumens.
3. Not available with L24, 24" fixture. 347V and 480V utilize a step-down transformer.
4. See ordering information on page 5. When choosing sensor options and and PLR configuration, contact factory representative.
5. Not available with cordsets.
6. Not available with L24, 24" fixture. See spec sheet PS1055LCP, PS1555LCP and PS750L for more information. Emergency battery backup only available from -4 °F (-20 °C) to 86 °F (30 °C)
7. Must specify voltage. 120, 208, 240 or 277V.
8. Only available with the 10,000LM and 14,000LM fixtures.
9. Voltage must be specified. This sensor configuration is suitable for minimum ambient temperature of 14°F (-10°C). See page 6 for low temperature option providing -4°F (-20°C) minimum ambient Sensors come prewired, they must be snapped into place at time of installation.
10. Cordsets exit back of fixture unless OUTEND option is specified. Must specify voltage (not required when ordering CS93W).
11. Not compatible with reflector.
12. Order 2 for tandem double length fixtures (TZL1D).

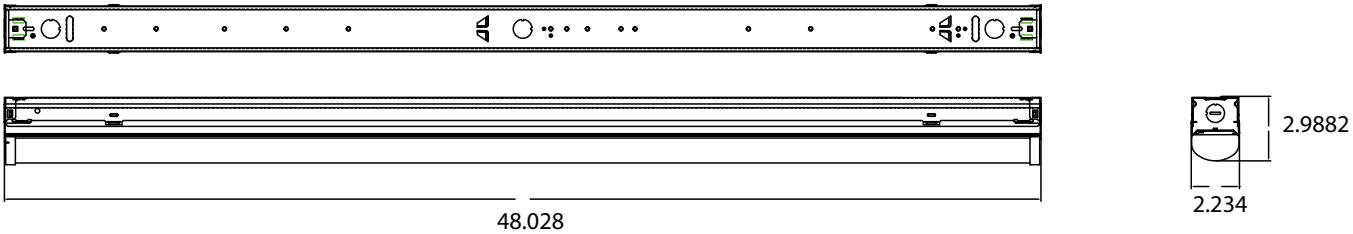
OPERATIONAL DATA												
	Nominal lumen package	Length (inches)	Delivered Lumens 3000 K CCT @ 77°F (25°C) ambient temperature		Delivered Lumens 3500 K CCT @ 77°F (25°C) ambient temperature		Delivered Lumens 4000 K CCT @ 77°F (25°C) ambient temperature		Delivered Lumens 5000 K CCT @ 77°F (25°C) ambient temperature		Wattage @ 120V/277V	Comparable Light Source
			80 CRI	90 CRI	80 CRI	90 CRI	80 CRI	90 CRI	80 CRI	90 CRI		
Lensed	1500LM	24	1985	1619	2030	1675	2061	1707	2137	1745	17	1-lamp 17W T8
	2500LM	24	2682	2187	2742	2264	2785	2307	2887	2358	22	1-lamp 17W T8
	3500LM	24	4099	3341	4190	3459	4255	3524	4412	3603	36	1-lamp 32W T8, 1-lamp 54W T5H0, 50W HID
	3000LM	48	3880	3163	3966	3274	4028	3336	4176	3410	30	1-lamp 32W T8, 1-lamp 54W T5H0, 50W HID
	5000LM	48	5337	4351	5456	4504	5541	4589	5745	4691	41	2-lamp 32W T8, 1-lamp 54W T5H0, 70W HID
	7000LM	48	7317	5965	7480	6175	7596	6291	7876	6431	59	3-lamp 32W T8, 2-lamp 54W T5H0, 100W HID
	6000LM	96	8077	6585	8257	6816	8386	6945	8694	7099	60	3-lamp 32W T8, 2-lamp 54W T5H0, 100W HID
	10000LM	96	11021	8985	11267	9301	11442	9477	11864	9687	81	4-lamp 32W T8, 2-lamp 54W T5H0, 100W HID
	14000LM	96	15397	12553	15741	12995	15986	13240	16574	13534	121	4-lamp 32W T8, 3-lamp 54W T5H0, 150W HID

DIMENSIONS

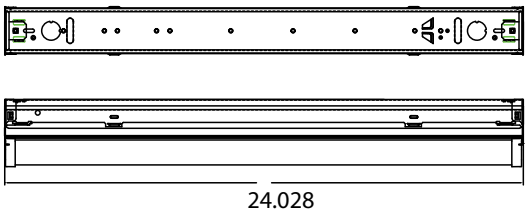
All dimensions are shown in inches (centimeters) unless otherwise noted.

Specifications subject to change without notice.

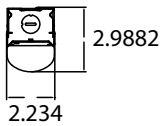
PALLET DIMENSIONS			
Length	Approximate weight	Fixtures per pallet	Approximate pallet dimensions (L x W x H)
L24	7 lbs.	176	46" X 51" X 31 5/8"
L48	13 lbs.	176	46" X 51" X 31 5/8"
L96	26 lbs.	63	46" X 98 1/2" X 31 3/8"



ZL1D L48

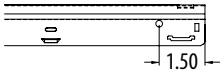


Knockout hole is .86in in diameter.



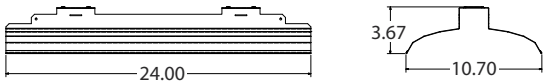
ZL1D L24

Mounting Hole Location - All Lengths

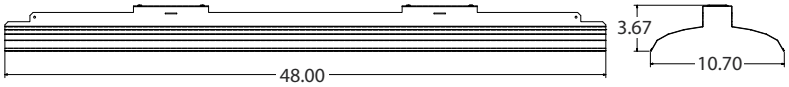


REFLECTORS (Optional)

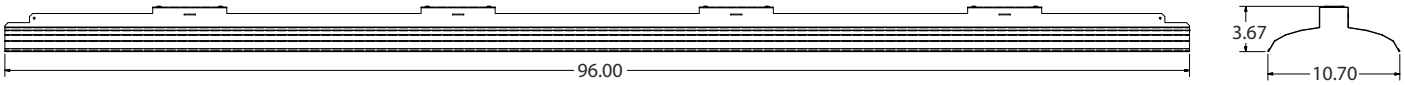
L24 Reflector



L48 Reflector



L96 Reflector



PHOTOMETRICS

Please see www.lithonia.com

PRODUCT INFORMATION

Advanced plug-in system with two-circuit capability. Available on industrial and strip products and a variety of architectural products mounted in continuous rows. 1, 2, 3 and 4-lamp fixtures. PLR22 (2-circuit) and crossover harness switches hot circuit serving next fixture in row. Reduces fixture types on job for alternating circuit applications (see example below.)

Easy one-step installation, saves up to 35% on labor costs. Expanded switching flexibility helps save energy.

Rows can be 50% longer with two-circuit systems. Polarized, lock-together nylon connectors prevent miswiring in the field. #12 THHN conductor, rated 600V, 90°C. White neutral wire included. Grounding accomplished by fixture in-row connectors.

CSA certified systems available with up to 2 circuits. G ground required.

Note: Specifications subject to change without notice.

Wiring

PLR

Advanced 1 or 2-Circuit Plug-In

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Series	Number of hot wires		Branch circuits				Dimming		Ground	
			Circuits to which ballast is connected		Emergency circuit connected					
PLR	(blank)	Not required for 22	(blank)	Not required for 22	(blank)	No emergency circuit	LV	Low-voltage dimming	G	Ground, required
PLR22	1	Black	A	Black wire	ELA	Emergency circuit wired to black wire				
	2	Black and red	B	Red wire	ELB	Emergency circuit wired to red wire				

Typical Applications

- Multiple-circuit and single-circuit for longer continuous rows
- Multiple-circuit with alternating fixtures on separate circuits and 2-circuit (PLR 22)
- Multiple circuit with night-lights located along row as desired

LSXR – Fixture Mount Occupancy Sensor (see www.AcuityControls.com for additional information)

- Three interchangeable lens options to satisfy multiple mounting heights and coverage pattern requirements.
- Integrated mounting bracket drops lens down 3" from chase nipple.
- Single or dual relay versions — designed with robust protection from the harsh switching requirements of T5 and LED loads.
- Photocell and 0-10VDC dimming options.
- No PIR field calibration or sensitivity adjustments required.
- Sensor ambient temperature rating of 14°F (-10°C) to 131°F (55°C).

LSXR configuration	Comparable CMRB sensor	Old style sensor nomenclature
For shortest lead times use one of the following LSXR configurations		
LC0ZU	CMRB 50	MSI
LCH0SZU	CMRB 50 D	MSID
LCPZU	CMRB 50 P	MSIPED
LA0ZU	CMRB 6	MSI360
LAH0SZU	CMRB 6 D	MSI360D
LAPZU	CMRB 6 P	MSI360PED

SELECTIONS BELOW WILL EXTEND ORDER LEAD TIME. CONSULT YOUR SALES REPRESENTATIVE FOR DETAILS.

SINGLE RELAY

ORDERING INFORMATION

Example: LAH0SZU

Series	Lens option	Dimming/Photocell	Max. dim level	Min. dim level	Temp/Humidity	Default occupancy time delay
L LSXR passive infrared indoor occupancy sensor	A High mount, 360° B Low mount, 360° C High mount aisleway	0 None[1] H High/low occupancy operation P Switching photocell (on/off)[1] M Dimming and switching photocell G Dimming and switching photocell with high/low occupancy operation	0 10 VDC 9 9 VDC 8 8 VDC 7 7 VDC	S Minimum dim level of ballast 1 1 VDC 2 2 VDC 3 3 VDC 4 4 VDC 5 5 VDC 6 6 VDC	Z None T Low temperature[2]	I 30 sec D 2.5 min X 5.0 min R 7.5 min U 10.0 min (with minimum 15 minute on time) V 15.0 min W 20.0 min Y 30.0 min

Notes

1 Max and min dim levels not applicable with this option.

2 Ambient temperature rating of -4°F (-20°C) to 131°F (55°C).

DUAL RELAY (Available with 120, 277, and 347V only)

ORDERING INFORMATION

Example: LA2KZU

Series	Lens option	Poles	Operating mode	Temp/Humidity	Default occupancy time delay
L LSXR passive infrared indoor occupancy sensor	A High mount, 360° B Low mount, 360° C High mount aisleway	2 Dual relay	J None K Alternating off relays (promotes even lamp wear) O Alternating off relays w/photocell P Switching photocell(on/off) E Photocell on/off (pole 1 only) F Photocell on/off - both poles (dual set-point)	Z None T Low temperature[1]	I 30 sec D 2.5 min X 5.0 min R 7.5 min U 10.0 min (with minimum 15 minute on time) V 15.0 min W 20.0 min Y 30.0 min

Notes

1 Ambient temperature rating of -4°F (-20°C) to 131°F (55°C).

Example: LENS 50 J100

Replacement lenses: *Order as separate catalog number.*

Series	Lens type	Package quantity
LENS	6 High mount 360° 10 Low mount 360° 50 High mount aisleway	[blank] Single Lens J10 10-pack J100 100-pack

PRODUCT INFORMATION

A standard occupancy time delay is also present to ensure lights turn off (once minimum on timer has also elapsed) if no occupancy is detected.

This timer is factory set at 10 minutes to promote energy savings, but is adjustable between 30 seconds and 30 minutes. These adjustments may be done through the unit's push-button.

FEATURES

- Four interchangeable lenses - high mount 360°, low mount 360°, high mount aisleway, and small motion 360°.
- Integrated mounting bracket drops lens down 3" from chase nipple - no bracket accessory required.
- 100% digital PIR detection - provides excellent RF immunity

Note: Specifications subject to change without notice.

Passive Infrared Indoor Occupancy Sensor

LSXR

Single Relay

AcuityControls. Sensor Switch.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LSXR 10 ADC HVOLT 30M

LSXR

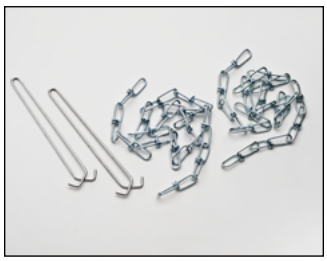
Series		Lens option				Dimming/photocell	
LSXR	Passive Infrared Indoor Occupancy Sensor	(blank)	No lens	610	High and low mount 360°	(blank)	None
		6	High mount, 360®	650	High mount 360° and aisleway	HL	High/low occupancy operation
		10	Low mount, 360°	3PK	High and low mount 360° and aisleway	P	Switching photocell (on/off)
		50	High mount aisleway	4PK	All lenses	ADC	Dimming and switching photocell
		9	Small motion, 360°			ANL	Dimming and switching photocell with high/low occupancy operation

Voltage		Max dim level		Min dim level		Lead length		Temp humidity		Default time delay	
(blank)	120-277 VAC (MVOLT)	(blank)	10 VDC	(blank)	Minimum dimming level of ballast	(blank)	14"	(blank)	None	(blank)	10 minutes (with minimum 15 minutes on time)
HVOLT	347-480 VAC	9H	9 VDC	1V	1 VDC	42L	42"	LT	Low temperature	5M	5 minutes (LED only)
		8H	8 VDC	2V	2 VDC					15M	15 minutes
		7H	7 VDC	3V	3 VDC					20M	20 minutes
				4V	4 VDC					30M	30 minutes
				5V	5 VDC						
				6V	6 VDC						

For additional information see www.lithonia.com

OPTIONS AND ACCESSORIE

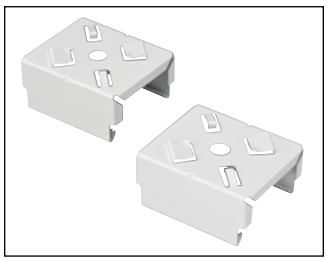
The Z Series fixture offers numerous options for almost every electrical and optical component, including a long list of field-installable accessories.



HANGER CHAIN

36" chain with Y hanger.

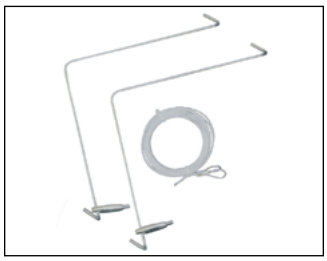
Order as:
HC36



Z SPRING HANGER

Snap 'n' lock design requires no fasteners and can be used on T-grid ceiling or universal mounting systems.

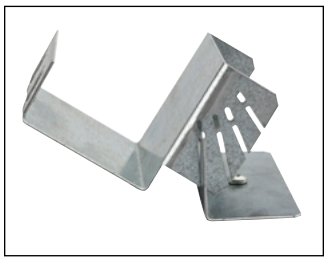
Order as:
ZSPRG



ZACVH HANGER

10' Aircraft cable with Y hanger.

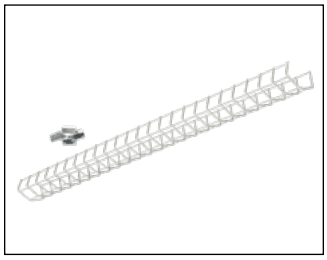
Order as:
ZACVH



ANGLE MOUNTING BRACKET

Luma-tilt™ angle bracket ships as a pair

Order as:
ZLANGBKT



WIRE GUARD

Order as:
WGZ24
WGZ48

7.0 Sustainability

A. Energy Efficient

1. Commercial New Construction (CNC) Program.

a. Using this program will provide information from a comprehensive analysis of energy efficiency options including mechanical and electrical systems based on energy simulation models configured to the projects parameters. This will assist the district in selecting the desired design approach.
b. This program is thru MidAmerican Energy Company with partnerships with Willdan.
c. Memorandum on energy efficiency approach options is included following this page.

B. Flexibility

1. Adapt for future needs.

MEMORANDUM

To: Michael J. Kros, DLR Group

From: Vinoth Sekar

Project: MidAmerican Energy Company
Commercial New Construction
Shenandoah CSD High School Renovations, Shenandoah, IA

Project No.: 4019379

Date: July 29, 2019

COMMERCIAL
NEW CONSTRUCTION
PROGRAM

Subject: Notes from the Results Meeting held July 25, 2019. Persons whose names are listed at the end of this document will receive notes from the meeting. The names of those who attended the meeting are shown in **bold**.

Summary: The purpose of the meeting was to review the Commercial New Construction program and energy conservation opportunities associated with the Shenandoah CSD High School Renovations project. Willdan presented results at the meeting.

Item: **Commercial New Construction Overview**

- Willdan facilitates a collaborative approach with the project team to evaluate energy savings strategies that are cost-effective and make sense for the owner's business.
- The intent of the process is to explore and quantify a number of alternative envelope, lighting, and mechanical materials and systems with the goal of selecting design strategies that demonstrate the highest value.
- Energy analysis results may be used to form the basis of custom incentives from MidAmerican Energy Company.

Action: None

Item: **Building Summary**

See attached building summary.

Action: None

Item: **Strategy and Incremental Cost Information**

The project team reviewed the strategy results and associated incremental cost information provided by Willdan and assembled bundles of strategies based on current design and group discussion.

- HVAC A and B will include a new DOAS unit with new ductwork, reusing the existing 4-pipe fan coil connected to a new gas boiler and new chiller.
- The team noted that the current Fan Coil Units have economizer which can bring in 700 cfm of Outside air compared to the DOAS alternate w/ economizer which can bring 350 cfm of outside air.
- HVAC C was included without DOAS. This Unit ventilators will have economizer and demand control ventilation included.
- The current wall assembly is precast/CMU wall with R-2.4 assembly. No upgrades to wall and roof assembly considered beyond code requirement.
- Cooling setpoints were updated as per design team's input. Office space was included in the model.
- No wall or roof insulation upgrades are currently planned.
- The design team selected energy-efficiency strategies for bundle 1 to represents the current design.

Action: The above changes are now incorporated and the revised results, incentives, and paybacks are shown in the attached table.

Item: **Energy Utility Service and Rates**

Action: Trudy Johannsen to confirm utility rates for Willdan.

Item: **Owner Incentive**

The Design Assistance program provides an incentive to the owner to help reduce the upfront costs associated with the addition of energy-saving strategies evaluated and verified by the program. The owner incentive is not intended to cover all increases in construction costs.

Kerri Nelson was identified as the recipient of the owner incentive.

Note that the incentive is subject to limitations described following the results table.

Action: **Owner** to contact MidAmerican Energy Company if there are further questions regarding the incentive offer.

Item: **Design Team Incentive**

The Commercial New Construction program provides an incentive to the design team for participation in the following activities: (1) participation at formal meetings; (2) transfer of building architectural/engineering design information to Willdan; (3) development of applicable energy conservation strategies' incremental costs (incremental as compared to the baseline); and (4) completion and forward of Construction Documents to Willdan.

Michael Kros was identified as the recipient of the Design Team incentive.

Action: Following distribution of the final Verification Report, **MidAmerican Energy Company** will send the design team lead an email with instructions on how to invoice for the design team participation incentive.

Item: **Verification Phase**

Verification, a process that seeks to assure that one of the bundles is implemented, will be laid out in detail in the coming weeks but will generally include the following:

- Owner notifies Willdan of the bundle selection.
- Willdan sends a Bundle Requirements Document to the project team tailored to the selected bundle strategies.
- Willdan verifies installed strategies when the building is completed and occupied and sends a Verification Report to the design team.
- MidAmerican Energy Company provides the incentive payment to the owner based on the Verification Report.

The purpose of the verification phase is to assist the project team and MidAmerican Energy Company toward realizing the energy conservation goals of the program and increasing the likelihood that the incentive proposed during the design phase is achieved upon completion of the project.

Item: **Next Steps**

Action: **Project Team** to select a bundle using the form provided with these minutes and forward the form to Willdan by August 9.

Building Summary

Building Summary		
Location	Shenandoah, IA	
Narrative	High school renovation	
Space Asset Areas	Area	Number of Stories
Classrooms	60,496 ft²	1
Office	2,000 ft²	1
Total	**62,496 ft²**	**1**
Exterior lighting	148,000 ft²	
Systems Summary		
Envelope	No wall or roof upgrades planned	
Glazing	Basis of design: U value - 0.38, SHGC - 0.37;	
Lighting	LEDs with vacancy sensors, daylight dimming planned	
Hours of Operation	Classrooms; Monday-Friday 6 AM-6 PM, unoccupied during summer; Office – Year round operation.	
Service Water Heating	Existing gas fired tank system	
HVAC Scenario A	4-pipe FCU with new air-cooled chiller, new condensing boiler; New ERV connected to building loop	
HVAC Scenario B	4-pipe FCU with new air-cooled chiller, new condensing boiler; New ERV with Gas furnace, DX cooling	
HVAC Scenario C – Unit Ventilator	4-Pipe Fan Coil with Gas Boiler and Air Cooled Chiller	
Utilities		
Electric Utility	MidAmerican Energy Company	
Gas Utility	MidAmerican Energy Company	
Schedule		
Construction Documents Complete	11/01/2019	
Construction Start	05/01/2020	
Occupancy	09/01/2020	
Baseline Reference	Utility protocol baseline based on ASHRAE 90.1-2010 Appendix G	
Other Notes		

Results for HVAC A

			Savings versus Baseline		
			Bundle 1	Bundle 2	Bundle 3
Project Name:	Shenandoah CSD High School Renovations	Energy Cost Savings	$14,035	$17,026	$20,183
Building Type:	Education - High School	Peak kW Savings	59.0	80.0	109.9
Area:	62,496 ft²	kWh Savings	137,562	175,042	222,734
		Gas Savings (Therm)	3,023	2,733	1,109
HVAC Scenario A	4-pipe FCU with new air-cooled chiller, new condensing boiler; New ERV connected to building loop	Incremental 1st Cost	$156,210	$194,423	$310,011
		Projected Incentive	$17,742	$24,263	$33,405
		Payback with Incentive	9.9	10.0	13.7
		EUI (KBtu/ft²/yr)	44.8	43.2	43.2

Strategy	Savings				Incremental First Cost	Payback	Bundle 1	Bundle 2	Bundle 3
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Mechanical									
DOAS									
DOAS fan power at 0.45 W/cfm	0.5	2,264	-4	$165	$2,500	15.2		x	x
DOAS Total heat recovery	15.8	748	1,346	$1,359	$52,372	38.5	x	x	x
Facility									
VFD on building heating water pump	0	1,271	-20	$58	$750	12.9	x	x	x
VFD on building chilled water pump	0	6,205	0	$412	$750	1.8	x	x	x
10% improved chiller efficiency	12.7	9,043	0	$1,139	$23,436	20.6	x		
20% improved chiller efficiency	25.4	18,111	0	$2,279	$46,872	20.6		x	
30% improved chiller efficiency	38.1	27,181	0	$3,407	$70,308	20.6			x
VFD on chiller compressor	14.8	22,337	0	$2,698	$10,187	3.8	x	x	x
85% efficient gas boiler	0	0	680	$440	$2,687	6.1			
95% efficient gas boiler with moderate temperature reset	0	276	1,828	$1,201	$9,749	8.1	x		
95% efficient gas boiler with aggressive temperature reset	0	-728	2,251	$1,407	$9,749	6.9		x	x
Classrooms									
Demand control ventilation for Office	-0.2	422	15	$75	$790	10.5			
Displacement ventilation for Office	1	2,002	-15	$256	$2,400	9.4			
Demand control ventilation for Classrooms	2	-770	1,381	$880	$23,896	27.2			
Displacement ventilation for Classrooms	19.8	29,268	31	$2,872	$72,595	25.3			x

Strategy	Savings				Incremental First Cost	Payback	Bundle 1	Bundle 2	Bundle 3
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Architectural									
Office									
Wall R 16	0.1	6	3	$6	$97	16.1			
Glazing high solar gain, metal frame	0.3	157	126	$103	$4,354	42.3			
Glazing medium solar gain, metal frame	0.9	1,516	68	$191	$5,435	28.5			
Glazing low solar gain, metal frame	1.5	2,634	1	$253	$6,618	26.2			
Glazing high solar gain w/ argon, metal frame	0.4	263	164	$140	$6,224	44.5	x		
Glazing medium solar gain w/ argon, metal frame	0.9	1,504	115	$218	$7,336	33.7		x	
Glazing low solar gain w/ argon, metal frame	1.5	2,640	50	$284	$8,700	30.6			x
Glazing high solar gain, improved metal frame	0.4	69	192	$143	$7,056	49.3			
Glazing medium solar gain, improved metal frame	1	1,477	138	$230	$8,393	36.5			
Glazing low solar gain, improved metal frame	1.5	2,645	75	$302	$9,856	32.6			
Classrooms									
Wall R 16	0.1	72	42	$36	$1,413	39.3			
Wall R 20	1.1	443	388	$333	$16,486	49.5			
Wall R 24	1.5	838	617	$525	$31,558	60.1			
Roof R 24	1	-421	518	$689	$19,157	27.8			
Roof R 30	3.7	-1,292	1,135	$897	$55,455	61.8			
Roof R 36	4.7	-2,394	1,496	$1,106	$128,050	100+			
Glazing high solar gain, metal frame	1.8	597	756	$596	$26,949	45.2			
Glazing medium solar gain, metal frame	5.2	8,310	332	$1,331	$33,638	25.3			
Glazing low solar gain, metal frame	8.3	15,393	-132	$1,634	$40,960	25.1			
Glazing high solar gain w/ argon, metal frame	2.3	1,108	986	$792	$38,519	48.6	x		
Glazing medium solar gain w/ argon, metal frame	5.2	7,912	614	$1,601	$45,404	28.4		x	
Glazing low solar gain w/ argon, metal frame	8.5	15,120	159	$1,800	$53,840	29.9			x
Glazing high solar gain, improved metal frame	2	-6	1,168	$860	$43,670	50.8			
Glazing medium solar gain, improved metal frame	5.3	7,714	758	$1,677	$51,942	31.0			
Glazing low solar gain, improved metal frame	8.6	14,998	307	$1,778	$60,997	34.3			
Lighting									
Facility									
Exterior site lighting reduced to 13.99 kW	1.6	5,792	0	$467	$0	0.0			
Exterior site lighting reduced to 12.44 kW	3.2	11,573	0	$937	$0	0.0			

Strategy	Savings				Incremental First Cost	Payback	Bundle 1	Bundle 2	Bundle 3
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Exterior site lighting reduced to 10.88 kW	4.7	17,365	0	$1,402	$0	0.0			
Exterior site lighting reduced to 9.33 kW	6.3	23,157	0	$1,855	$0	0.0			
Exterior site lighting reduced to 7.78 kW	7.8	28,949	0	$2,281	$0	0.0	x		
Exterior site lighting reduced to 6.22 kW	9.4	34,735	0	$2,687	$0	0.0		x	
Exterior site lighting reduced to 4.67 kW	10.9	40,527	0	$3,087	$0	0.0			x
Exterior site lighting reduced to 3.11 kW	12.5	46,315	0	$3,476	$0	0.0			
Office									
Dimming daylighting control, 50% of space	0.1	110	-2	$7	$90	12.9			
Dimming daylighting control, 75% of space	0.2	1,192	-16	$82	$506	6.2			
Dimming daylighting control, 100% of space	0.3	2,231	-29	$149	$921	6.2	x	x	x
Occupancy sensor controls, 100% of space	0.2	876	-13	$86	$350	4.1			
Vacancy sensor controls, 100% of space	0.3	1,156	-17	$107	$350	3.3	x	x	x
Lighting power in Office reduced to 0.81 W/ft²	0.3	542	-8	$39	$47	1.2			
Lighting power in Office reduced to 0.72 W/ft²	0.4	1,047	-15	$73	$107	1.5	x		
Lighting power in Office reduced to 0.63 W/ft²	0.7	1,588	-23	$117	$244	2.1		x	
Lighting power in Office reduced to 0.54 W/ft²	0.8	2,112	-31	$148	$556	3.8			x
Lighting power in Office reduced to 0.45 W/ft²	1	2,610	-39	$190	$1,268	6.7			
Classrooms									
Dimming daylighting control, 50% of space	0.4	3,468	-66	$223	$2,201	9.9			
Dimming daylighting control, 75% of space	1.3	9,854	-187	$586	$5,904	10.1			
Dimming daylighting control, 100% of space	2.2	16,161	-307	$940	$9,607	10.2	x	x	x
Vacancy sensor controls, 100% of space	3.8	12,864	-178	$1,033	$0	0.0	x	x	x
Lighting power in Classrooms reduced to 0.89 W/ft²	6.1	18,973	-279	$1,519	$1,420	0.9			
Lighting power in Classrooms reduced to 0.79 W/ft²	11.7	37,803	-576	$2,674	$3,238	1.2	x		
Lighting power in Classrooms reduced to 0.69 W/ft²	17.8	56,468	-889	$3,830	$7,381	1.9		x	
Lighting power in Classrooms reduced to 0.59 W/ft²	23.3	75,222	-1,222	$5,009	$16,827	3.4			x
Lighting power in Classrooms reduced to 0.50 W/ft²	28.8	93,645	-1,566	$6,240	$38,358	6.1			

Results for HVAC B

			Savings versus Baseline		
			Bundle 4	Bundle 5	Bundle 6
Project Name:	Shenandoah CSD High School Renovations	Energy Cost Savings	$13,176	$16,370	$19,368
Building Type:	Education - High School	Peak kW Savings	58.3	78.3	108.6
Area:	62,496 ft²	kWh Savings	130,832	168,440	214,879
		Gas Savings (Therm)	2,575	2,342	870
HVAC Scenario B	4-pipe FCU with new air-cooled chiller, new condensing boiler; New ERV with Gas furnace, DX cooling	Incremental 1st Cost	$179,646	$243,982	$383,007
		Projected Incentive	$16,182	$22,555	$31,383
		Payback with Incentive	12.4	13.5	18.2
		EUI (KBtu/ft²/yr)	45.2	43.5	43.3

Strategy	Savings				Incremental First Cost	Payback	Bundle 4	Bundle 5	Bundle 6
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Mechanical									
DOAS									
DOAS fan power at 0.45 W/cfm	0.3	2,236	-4	$160	$2,500	15.6		x	x
DOAS 5% improved DX cooling efficiency	1.5	366	0	$51	$11,718	100+			
DOAS 10% improved DX cooling efficiency	2.8	702	0	$106	$23,436	100+	x		
DOAS 20% improved DX cooling efficiency	5.1	1,286	0	$188	$46,872	100+		x	
DOAS 30% improved DX cooling efficiency	7	1,783	0	$260	$70,308	100+			x
DOAS High efficiency DX compressor part load performance	0.8	2,331	0	$229	$23,436	100+			
DOAS Premium efficiency DX compressor part load performance	11.1	2,271	0	$375	$76,558	100+			
DOAS 85% efficient gas furnace	0	0	233	$153	$2,687	17.6		x	x
DOAS 90% efficient gas furnace	0	0	440	$286	$6,218	21.7			
DOAS 95% efficient gas furnace	0	0	626	$404	$9,749	24.1			
DOAS Total heat recovery	10.7	-6	1,339	$1,215	$52,372	43.1	x	x	x
Facility									
VFD on building heating water pump	0	969	-13	$45	$750	16.7	x	x	x
VFD on building chilled water pump	0	3,794	0	$251	$750	3.0	x	x	x
10% improved chiller efficiency	9.4	7,966	0	$995	$23,436	23.6	x		
20% improved chiller efficiency	18.8	15,957	0	$1,992	$46,872	23.5		x	
30% improved chiller efficiency	28.2	23,947	0	$2,984	$70,308	23.6			x
VFD on chiller compressor	9.4	20,179	0	$2,210	$10,187	4.6	x	x	x

Strategy	Savings				Incremental First Cost	Payback	Bundle 4	Bundle 5	Bundle 6
	Peak kW	kWh	Gas (Therm)	Energy Cost					
85% efficient gas boiler	0	0	441	$285	$2,687	9.4			
95% efficient gas boiler with moderate temperature reset	0	211	1,217	$798	$9,749	12.2	x		
95% efficient gas boiler with aggressive temperature reset	0	-598	1,478	$926	$9,749	10.5		x	x
Classrooms									
Demand control ventilation for Office	-0.2	256	14	$68	$790	11.6			
Displacement ventilation for Office	0.8	2,302	-16	$263	$2,400	9.1			
Demand control ventilation for Classrooms	1.7	-1,202	1,362	$837	$23,896	28.5			
Displacement ventilation for Classrooms	17.6	27,872	-1	$2,731	$72,595	26.6			x
Architectural									
Office									
Wall R 16	0	4	3	$3	$97	32.2			
Glazing high solar gain, metal frame	0.2	98	126	$98	$4,354	44.4			
Glazing medium solar gain, metal frame	0.8	1,513	69	$190	$5,435	28.6			
Glazing low solar gain, metal frame	1.4	2,663	1	$251	$6,618	26.4			
Glazing high solar gain w/ argon, metal frame	0.4	188	165	$133	$6,224	46.8	x		
Glazing medium solar gain w/ argon, metal frame	0.9	1,479	115	$216	$7,336	34.0		x	
Glazing low solar gain w/ argon, metal frame	1.4	2,666	50	$284	$8,700	30.6			x
Glazing high solar gain, improved metal frame	0.3	-21	192	$133	$7,056	53.1			
Glazing medium solar gain, improved metal frame	0.9	1,445	139	$228	$8,393	36.8			
Glazing low solar gain, improved metal frame	1.4	2,670	75	$302	$9,856	32.6			
Classrooms									
Wall R 16	0.1	72	42	$37	$1,413	38.2			
Wall R 20	1.1	475	390	$339	$16,486	48.6			
Wall R 24	1.5	840	620	$529	$31,558	59.7			
Roof R 24	0.9	-522	521	$695	$19,157	27.6			
Roof R 30	3.5	-1,703	1,143	$887	$55,455	62.5			
Roof R 36	4.5	-2,912	1,506	$1,089	$128,050	100+			
Glazing high solar gain, metal frame	1.6	656	760	$610	$26,949	44.2			
Glazing medium solar gain, metal frame	5.1	8,145	333	$1,339	$33,638	25.1			
Glazing low solar gain, metal frame	8.3	15,040	-131	$1,629	$40,960	25.1			
Glazing high solar gain w/ argon, metal frame	2.2	1,155	991	$801	$38,519	48.1	x		

Strategy	Savings				Incremental First Cost	Payback	Bundle 4	Bundle 5	Bundle 6
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Glazing medium solar gain w/ argon, metal frame	5	7,760	618	$1,612	$45,404	28.2		x	
Glazing low solar gain w/ argon, metal frame	8.5	14,835	160	$1,804	$53,840	29.8			x
Glazing high solar gain, improved metal frame	1.8	75	1,176	$870	$43,670	50.2			
Glazing medium solar gain, improved metal frame	5.1	7,560	762	$1,693	$51,942	30.7			
Glazing low solar gain, improved metal frame	8.6	14,729	309	$1,768	$60,997	34.5			
Lighting									
Facility									
Exterior site lighting reduced to 13.99 kW	1.6	5,792	0	$464	$0	0.0			
Exterior site lighting reduced to 12.44 kW	3.2	11,573	0	$932	$0	0.0			
Exterior site lighting reduced to 10.88 kW	4.7	17,365	0	$1,400	$0	0.0			
Exterior site lighting reduced to 9.33 kW	6.3	23,157	0	$1,867	$0	0.0			
Exterior site lighting reduced to 7.78 kW	7.8	28,949	0	$2,294	$0	0.0	x		
Exterior site lighting reduced to 6.22 kW	9.4	34,735	0	$2,695	$0	0.0		x	
Exterior site lighting reduced to 4.67 kW	10.9	40,527	0	$3,096	$0	0.0			x
Exterior site lighting reduced to 3.11 kW	12.5	46,315	0	$3,484	$0	0.0			
Office									
Dimming daylighting control, 50% of space	0	108	-2	$9	$90	10.0			
Dimming daylighting control, 75% of space	0.1	1,194	-16	$80	$506	6.3			
Dimming daylighting control, 100% of space	0.2	2,239	-30	$148	$921	6.2	x	x	x
Occupancy sensor controls, 100% of space	0.1	969	-13	$90	$350	3.9			
Vacancy sensor controls, 100% of space	0.2	1,294	-17	$113	$350	3.1	x	x	x
Lighting power in Office reduced to 0.81 W/ft²	0.2	618	-8	$41	$47	1.1			
Lighting power in Office reduced to 0.72 W/ft²	0.4	1,203	-16	$80	$107	1.3	x		
Lighting power in Office reduced to 0.63 W/ft²	0.6	1,802	-23	$121	$244	2.0		x	
Lighting power in Office reduced to 0.54 W/ft²	0.7	2,408	-31	$162	$556	3.4			x
Lighting power in Office reduced to 0.45 W/ft²	1	2,957	-40	$200	$1,268	6.3			
Classrooms									
Dimming daylighting control, 50% of space	0.4	3,433	-67	$222	$2,201	9.9			
Dimming daylighting control, 75% of space	1.2	9,854	-189	$586	$5,904	10.1			
Dimming daylighting control, 100% of space	2.2	16,193	-309	$943	$9,607	10.2	x	x	x
Vacancy sensor controls, 100% of space	3.7	12,849	-179	$1,039	$0	0.0	x	x	x

Strategy	Savings				Incremental First Cost	Payback	Bundle 4	Bundle 5	Bundle 6
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Lighting power in Classrooms reduced to 0.89 W/ft²	6	18,956	-282	$1,527	$1,420	0.9			
Lighting power in Classrooms reduced to 0.79 W/ft²	11.7	37,735	-582	$2,673	$3,238	1.2	x		
Lighting power in Classrooms reduced to 0.69 W/ft²	17.7	56,332	-897	$3,816	$7,381	1.9		x	
Lighting power in Classrooms reduced to 0.59 W/ft²	23.3	75,040	-1,233	$5,000	$16,827	3.4			x
Lighting power in Classrooms reduced to 0.50 W/ft²	28.8	93,396	-1,579	$6,223	$38,358	6.2			

Results for HVAC C

			Savings versus Baseline		
			Bundle 7	Bundle 8	Bundle 9
Project Name:	Shenandoah CSD High School Renovations	Energy Cost Savings	$12,982	$15,973	$18,391
Building Type:	Education - High School	Peak kW Savings	54.3	74.9	94.5
Area:	62,496 ft²	kWh Savings	132,972	169,070	201,993
		Gas Savings (Therm)	2,604	2,293	1,536
HVAC Scenario C	4-pipe FCU with new air-cooled chiller, new condensing boiler, no DOAS				
Unit Ventilator		Incremental 1st Cost	$127,734	$163,448	$206,441
		Projected Incentive	$16,433	$22,581	$28,805
		Payback with Incentive	8.6	8.8	9.7
		EUI (KBtu/ft²/yr)	44.1	42.6	42.0

Strategy	Savings				Incremental First Cost	Payback	Bundle 7	Bundle 8	Bundle 9
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Mechanical									
Facility									
VFD on building heating water pump	0	1,225	-18	$58	$750	12.9	x	x	x
VFD on building chilled water pump	0	4,778	0	$341	$750	2.2	x	x	x
10% improved chiller efficiency	12.6	8,820	0	$1,113	$23,436	21.1	x		
20% improved chiller efficiency	25.2	17,664	0	$2,221	$46,872	21.1		x	
30% improved chiller efficiency	37.8	26,509	0	$3,325	$70,308	21.1			x
VFD on chiller compressor	12.4	22,364	0	$2,624	$10,187	3.9	x	x	x
85% efficient gas boiler	0	0	639	$413	$2,687	6.5			
95% efficient gas boiler with moderate temperature reset	0	256	1,722	$1,128	$9,749	8.6	x		
95% efficient gas boiler with aggressive temperature reset	0	-666	2,116	$1,333	$9,749	7.3		x	x
Unit Ventilator									
Displacement ventilation for Office	0.4	1,228	-75	$45	$2,400	53.3			
Demand control ventilation for Classrooms	1.9	-1,908	1,006	$501	$23,896	47.7	x	x	x
Displacement ventilation for Classrooms	7.7	20,301	-2,373	$452	$72,595	100+			
Architectural									
Office									
Wall R 16	0.1	10	3	$2	$97	48.3			
Glazing high solar gain, metal frame	0.4	2	130	$99	$4,354	44.0			
Glazing medium solar gain, metal frame	1	1,715	68	$200	$5,435	27.2			

Strategy	Savings				Incremental First Cost	Payback	Bundle 7	Bundle 8	Bundle 9
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Glazing low solar gain, metal frame	1.6	3,139	-4	$272	$6,618	24.3			
Glazing high solar gain w/ argon, metal frame	0.5	69	170	$131	$6,224	47.5	x		
Glazing medium solar gain w/ argon, metal frame	1	1,628	116	$223	$7,336	32.9		x	
Glazing low solar gain w/ argon, metal frame	1.6	3,158	47	$307	$8,700	28.3			x
Glazing high solar gain, improved metal frame	0.4	-204	199	$132	$7,056	53.5			
Glazing medium solar gain, improved metal frame	1	1,552	141	$234	$8,393	35.9			
Glazing low solar gain, improved metal frame	1.6	3,157	73	$324	$9,856	30.4			
Classrooms									
Wall R 16	0.2	36	43	$37	$1,413	38.2			
Wall R 20	1.1	538	403	$327	$16,486	50.4			
Wall R 24	1.6	861	641	$343	$31,558	92.0			
Roof R 24	1.6	371	638	$390	$19,157	49.1			
Roof R 30	3.3	484	1,459	$798	$55,455	69.5			
Roof R 36	5.4	380	1,992	$1,350	$128,050	94.9			
Glazing high solar gain, metal frame	1.8	780	790	$268	$26,949	100+			
Glazing medium solar gain, metal frame	5.3	8,533	324	$956	$33,638	35.2			
Glazing low solar gain, metal frame	8.8	15,719	-171	$1,363	$40,960	30.1			
Glazing high solar gain w/ argon, metal frame	2.4	1,266	1,028	$696	$38,519	55.3	x		
Glazing medium solar gain w/ argon, metal frame	5.6	8,210	620	$1,119	$45,404	40.6		x	
Glazing low solar gain w/ argon, metal frame	9	15,482	130	$1,599	$53,840	33.7			x
Glazing high solar gain, improved metal frame	2.1	194	1,224	$756	$43,670	57.8			
Glazing medium solar gain, improved metal frame	5.7	8,037	770	$1,164	$51,942	44.6			
Glazing low solar gain, improved metal frame	9.1	15,396	283	$1,722	$60,997	35.4			
Lighting									
Facility									
Exterior site lighting reduced to 13.99 kW	1.6	5,792	0	$471	$0	0.0			
Exterior site lighting reduced to 12.44 kW	3.2	11,573	0	$936	$0	0.0			
Exterior site lighting reduced to 10.88 kW	4.7	17,365	0	$1,401	$0	0.0			
Exterior site lighting reduced to 9.33 kW	6.3	23,157	0	$1,870	$0	0.0			
Exterior site lighting reduced to 7.78 kW	7.8	28,949	0	$2,323	$0	0.0	x		
Exterior site lighting reduced to 6.22 kW	9.4	34,735	0	$2,756	$0	0.0		x	

Strategy	Savings				Incremental First Cost	Payback	Bundle 7	Bundle 8	Bundle 9
	Peak kW	kWh	Gas (Therm)	Energy Cost					
Exterior site lighting reduced to 4.67 kW	10.9	40,527	0	$3,177	$0	0.0			x
Exterior site lighting reduced to 3.11 kW	12.5	46,315	0	$3,572	$0	0.0			
Office									
Dimming daylighting control, 50% of space	0.1	107	-2	$11	$90	8.2			
Dimming daylighting control, 75% of space	0.2	1,182	-16	$81	$506	6.2			
Dimming daylighting control, 100% of space	0.3	2,255	-30	$150	$921	6.1	x	x	x
Occupancy sensor controls, 100% of space	0.3	984	-14	$89	$350	3.9			
Vacancy sensor controls, 100% of space	0.4	1,314	-18	$115	$350	3.0	x	x	x
Lighting power in Office reduced to 0.81 W/ft²	0.4	610	-8	$43	$47	1.1			
Lighting power in Office reduced to 0.72 W/ft²	0.5	1,218	-16	$85	$107	1.3	x		
Lighting power in Office reduced to 0.63 W/ft²	0.7	1,812	-25	$123	$244	2.0		x	
Lighting power in Office reduced to 0.54 W/ft²	0.9	2,413	-33	$161	$556	3.5			x
Lighting power in Office reduced to 0.45 W/ft²	1.1	2,989	-41	$200	$1,268	6.3			
Classrooms									
Dimming daylighting control, 50% of space	0.5	3,405	-67	$291	$2,201	7.6			
Dimming daylighting control, 75% of space	1.3	9,852	-192	$482	$5,904	12.2			
Dimming daylighting control, 100% of space	2.2	16,222	-314	$841	$9,607	11.4	x	x	x
Vacancy sensor controls, 100% of space	3.5	12,633	-222	$558	$0	0.0	x	x	x
Lighting power in Classrooms reduced to 0.89 W/ft²	5.8	18,483	-347	$989	$1,420	1.4			
Lighting power in Classrooms reduced to 0.79 W/ft²	11.8	37,107	-704	$2,293	$3,238	1.4	x		
Lighting power in Classrooms reduced to 0.69 W/ft²	18.1	55,677	-1,067	$3,344	$7,381	2.2		x	
Lighting power in Classrooms reduced to 0.59 W/ft²	24.3	73,922	-1,439	$4,559	$16,827	3.7			x
Lighting power in Classrooms reduced to 0.50 W/ft²	30	92,533	-1,817	$5,513	$38,358	7.0			

Bundle Results Summary

Bundled Annual Savings

Bundle Description	Peak kW Savings	% Peak kW Savings	kWh Savings	% kWh Savings	Gas Savings (Therm)	% Gas Savings	Energy Cost Savings
Bundle 1	59	21	137,562	20	3,023	26	$14,035
Bundle 2	80	29	175,042	25	2,733	23	$17,026
Bundle 3	110	39	222,734	32	1,109	9	$20,183
Bundle 4	58	21	130,832	19	2,575	22	$13,176
Bundle 5	78	29	168,440	24	2,342	20	$16,370
Bundle 6	109	40	214,879	31	870	7	$19,368
Bundle 7	54	19	132,972	19	2,604	24	$12,982
Bundle 8	75	27	169,070	24	2,293	21	$15,973
Bundle 9	95	34	201,993	29	1,536	14	$18,391

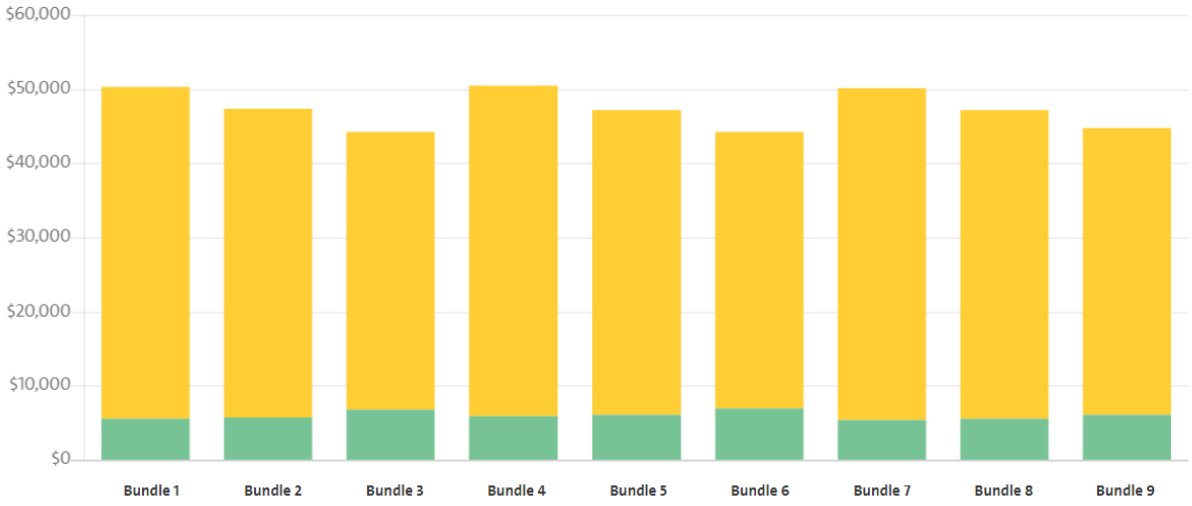
Simple Payback with Incentive

Bundle Description	Energy Cost Savings	Incremental First Cost	MidAmerican Energy Company			Payback in Years**
			Electric Incentive	Custom Gas Incentive*	Total Incentive	
Bundle 1	$14,035	$156,210	$14,719	$3,023	$17,742	9.9
Bundle 2	$17,026	$194,423	$21,530	$2,733	$24,263	10.0
Bundle 3	$20,183	$310,011	$32,296	$1,109	$33,405	13.7
Bundle 4	$13,176	$179,646	$13,607	$2,575	$16,182	12.4
Bundle 5	$16,370	$243,982	$20,213	$2,342	$22,555	13.5
Bundle 6	$19,368	$383,007	$30,513	$870	$31,383	18.2
Bundle 7	$12,982	$127,734	$13,829	$2,604	$16,433	8.6
Bundle 8	$15,973	$163,448	$20,288	$2,293	$22,581	8.8
Bundle 9	$18,391	$206,441	$27,269	$1,536	$28,805	9.7

** MidAmerican Energy Company offers custom gas incentives for renovation projects (without change of space use) at $1/therm. MidAmerican Energy Company's energy efficiency incentives are available to customers that purchase natural gas service (commodity) from MidAmerican Energy. Customers who elect to pursue "transport-only" arrangements with MidAmerican Energy (including MidAmerican Unregulated Retail Service, or URS) may or may not be eligible for energy efficiency incentives. Customers receiving monthly metered natural gas transportation service pay into the energy efficiency cost recovery fund and are eligible for natural gas incentives; customers receiving daily metered natural gas transportation services do not pay into the fund and are not eligible for natural gas energy efficiency incentives. Natural gas incentives will not be quoted for this project because MidAmerican Energy has received information that this project will be receiving daily metered natural gas transportation services. If this information is not accurate, please notify MidAmerican Energy or Willdan.*

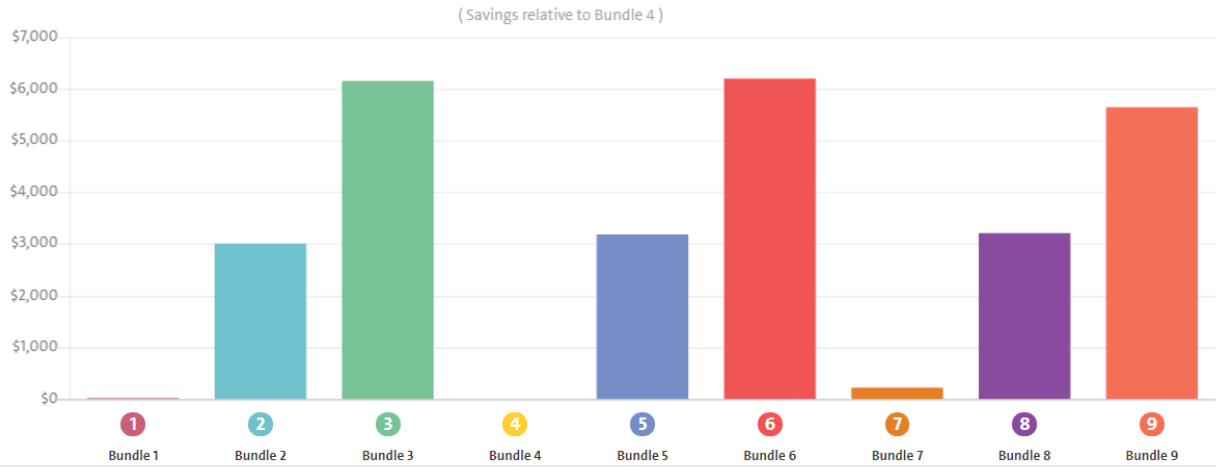
***MidAmerican Energy Company's Commercial New Construction incentives cannot reduce the simple payback below one year, may not exceed 50% of the total bundled incremental strategy costs, and are capped at $200,000 per building.*

Annual Energy Cost



	Bundle 1	Bundle 2	Bundle 3	Bundle 4	Bundle 5	Bundle 6	Bundle 7	Bundle 8	Bundle 9
Total	$50,364	$47,373	$44,216	$50,381	$47,187	$44,189	$50,153	$47,162	$44,744
Electricity	$44,760	$41,581	$37,375	$44,542	$41,197	$37,246	$44,727	$41,533	$38,625
Natural Gas	$5,604	$5,792	$6,841	$5,839	$5,990	$6,943	$5,426	$5,629	$6,119

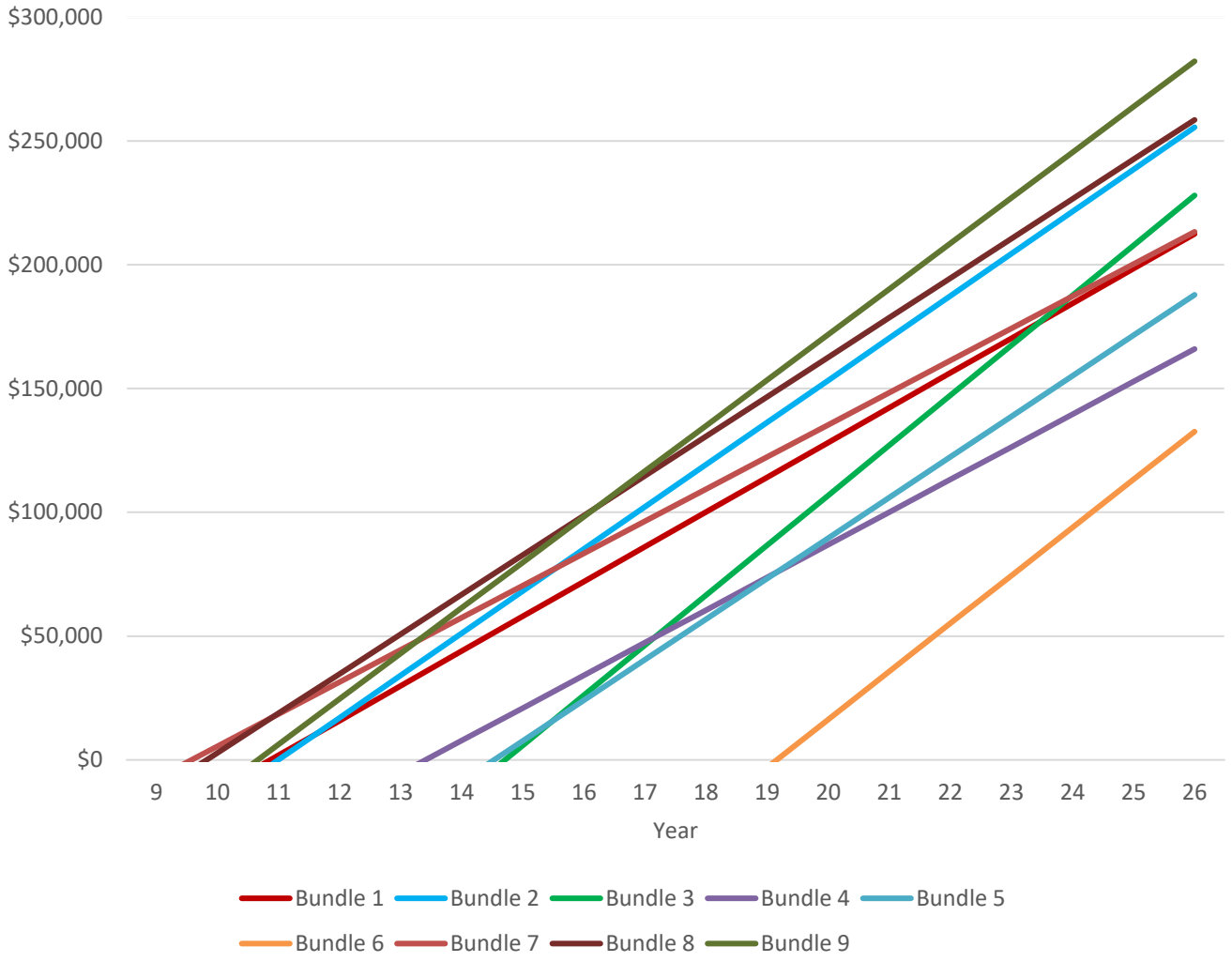
Relative Savings



	Bundle 1	Bundle 2	Bundle 3	Bundle 4	Bundle 5	Bundle 6	Bundle 7	Bundle 8	Bundle 9
Relative Savings	$17	$3,008	$6,165	$0	$3,194	$6,192	$228	$3,219	$5,637

Savings are relative to Bundle 4 which has the highest annual energy cost.

Cumulative Savings (span of 25 years)



Cumulative Savings at Year 25	Bundle 1	Bundle 2	Bundle 3	Bundle 4	Bundle 5	Bundle 6	Bundle 7	Bundle 8	Bundle 9
	$212,407	$255,490	$227,969	$165,936	$187,823	$132,576	$213,249	$258,458	**$282,139**

Key Model Inputs

Core Definition

Space Asset Area	Type	Area (ft²)	Floors	Arrangement	Flr/Flr Height
Office	Office	2,000	1	Adjacent / Grade	12
Classrooms	Classrooms	60,496	1	Adjacent / Grade	12

Schedules

Space Asset Area	People Density (ft²/person)	Daily Use							Hours per Day	Applicable Months											
		S	M	T	W	T	F	S		J	F	M	A	M	J	J	A	S	O	N	D
Office	200.0	●	●	●	●	●	●	●	13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Classrooms	n/a	●	●	●	●	●	●	●	13	✓	✓	✓	✓	✓				✓	✓	✓	✓
Classrooms(2)	n/a	●	●	●	●	●	●	●	9						✓	✓	✓				

● *Full Use*
● *Partial Use*
● *No Use*

Thermostat

Space Asset Area	Heating Set Point (°F)		Cooling Set Point (°F)	
	Occupied	*Unoccupied*	*Occupied*	*Unoccupied*
Office	70	60	73	78
Classrooms	70	60	73	78

Ventilation Requirements

Space Asset Area	Outside Air Per Person (ft³/min/person)	Outside Air Per Area (ft³/min/ft²)	Exhaust Flow Per Area (ft³/min/ft²)	Air Changes (ACH)	
				Occupied	*Unoccupied*
Office	5.0	0.06	0.00	n/a	n/a
Classrooms	10.0	0.12	0.00	n/a	n/a

Power & Process Load

Space Asset Area	Power Density (W/ft²)	Process Load	
	Equipment	*Load (Btu/hr/ft²)*	*Fuel Source*
Office	0.75	0.00	Gas
Classrooms	0.88	0.00	Gas

Utility Rates

Fuel	Utility	Rate
Electric	MidAmerican Energy Company	2019 - General Demand Service - Rate GD
Gas	Monthly Metered Transport Gas	Average rate: $0.65 per therm

MidAmerican Energy Company, Commercial New Construction

Bundle Selection Form for Shenandoah CSD High School Renovations, Shenandoah, IA

Please select a bundle below, note any required modifications, and complete the contact information. After completion, please return this form to Willdan, who will process the results for MidAmerican Energy Company.

Willdan
Attn: Vinoth Sekar
Email: vsekar@willdan.com

Goal Date: August 9, 2019

After reviewing the results and incentives as outlined in this document, we have chosen the following bundle for implementation. We hereby request that Willdan note this selection, which will begin the verification process.

Bundle compositions and payback analysis are included for reference.

Please Select One

HVAC A		HVAC B		HVAC C	
Bundle 1	☐	Bundle 4	☐	Bundle 7	☐
Bundle 2	☐	Bundle 5	☐	Bundle 8	☐
Bundle 3	☐	Bundle 6	☐	Bundle 9	☐

Please note any special circumstances or bundle modifications here:

_____

_____

_____

_____

_____

_____

Name _____

Company _____

Date _____

Copies:

Attendees shown in **bold**.

Name	Company	Email	Phone
Steve Hielen	**Shenandoah Community School District**	**hielens@shencsd.com**	**7122464727**
Kerri Nelson	Shenandoah Community School District	nelsonk@shencsd.com	712.246.1581
Paul Fisher	**DLR Group**	**pfisher@dlrgroup.com**	**402.972.4053**
Tim Gilbert	DLR Group	tgilbert@DLRGROUP.com	402.393.4100
Eric Kamin	**DLR Group**	**ekamin@dlrgroup.com**	**402.972.4069**
Michael J. Kros	**DLR Group**	**mkros@dlrgroup.com**	**402.972.4072**
Cindy L Larson	**Carl A. Nelson & Co.**	**clarson@carlanelsonco.com**	**319.754.8415**
Tim Seibert	**Carl A. Nelson & Co.**	**Tseibert@carlanelsonco.com**	**319.754.8415**
Trudy Johannsen	MidAmerican Energy Company	tljohannsen@midamerican.com	712-366-5652
Carly Langfeldt	MidAmerican Energy Company	CSLangfeldt@midamerican.com	563.333.8206
Erin Orth	MidAmerican Energy Company	EMOrth@midamerican.com	563-333-8038
Abed Alkhatib	**Willdan**	**aalkhatib@willdan.com**	**9529381588**
Vinoth Sekar	**Willdan**	**vsekar@willdan.com**	**515.271.9907**

8.0 Project Budget

A. See attached for budget as of the 25% Schematic Design documents.

1. Page 9 of the budget summary sheets is the renovation costs.
2. If it will be known that the additions will be built, then there could be some saving in the renovation by not doing work in those areas until the additions are done. See the following information.
3. Following the 25% SD budget document is the detail for the renovation budget.
4. Any significant revisions to the budget based on the current design information will be updated in the near future.
5. CANCO to update budget following Design Development submittal.

25% Schematic Budget Report

Shenandoah Community School District

Shenandoah High School
Shenandoah, Iowa

July 22, 2019

Prepared by:

CARL A. NELSON & CO. NELSON
Building Solutions Since 1913

Cindy Larson, NCARB, Project Manager
Tim Seibert, P.E., Project Executive
Carl A. Nelson & Co.
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BUDGET BASIS

The budgets contained herein are based on the following documents:

1. Schematic Design Project Submittal prepared by DLR Group and dated July 8, 2019.
2. Schematic Design Drawings prepared by DLR Group as follows:
    a. C2.1 dated July 8, 2019
    b. A1.1 dated July 8, 2019 transmitted on July 11, 2019
    c. A1.2 dated July 8, 2019
    d. A6.1 dated July 8, 2019
    e. A6.2 dated July 8, 2019
3. Schematic Schedule dated July 22, 2019 (included on page 13).
4. Design meeting discussions and various e-mail clarifications.
5. The scope described below.

Based on the development level of the documents that are the basis of these budgets and the corresponding estimating techniques used to prepare the budgets, we would expect the actual bid cost of the project would be within ±15% of these budgets. We have included a 15% contingency in the budgets to accommodate this expected variation.

RENOVATION SCOPE

The existing school gross floor area is approximately 94,000 SF, but the renovation scope excludes the existing gym, wrestling (safe) room addition and the auditorium addition except for the auditorium lobby and restrooms. Therefore, the gross area that is being addressed in the "Renovation" scope is 63,400 SF. The "Renovation" scope consists of four general categories of work.

1. Upgrading the HVAC System
    a. Changing the building fresh air supply to the non-shop classroom portion of the building from the unit ventilators to a dedicated outdoor air system (DOAS) system. This would include new ductwork primarily in the corridors and diffusers and registers in the classrooms. Installing the ductwork requires the removal of the ceiling and grid and removing and reinstalling a portion of the fire alarm system.
    b. New chillers, boilers and related pumps sized to replace equipment at the end of its useful life, sized for currently planned additions.
    c. Locker room DOAS system to improve ventilation in this portion of the building.
    d. Science Room DOAS system and new fume hoods to improve ventilation in this portion of the building.
    e. Modernize the HVAC control system in the building for improved control and maintenance.

2. Increasing Energy Efficiency/Improving Technology
    a. Furring out and spray foam insulating the majority of the exterior walls to improve energy efficiency of the building. This work affects additional finish items such as ceiling grid, ceiling tile, window sills and wall base.
        i. Areas within the "Renovation" excluded from the furred wall scope include the kitchen, west wall of consumer education, boiler room, locker rooms and vestibules.

b. New LED lighting throughout the Renovation area, including controls for daylight harvesting and occupancy sensors.
c. New data closets with dedicated HVAC.
d. New data cables and switches, racks, data com room, and wiring to wireless access points but reusing recently installed wireless access points.
e. Two new convenience receptacles in each classroom.
f. Replace intercom system.

3. Improving ADA Accessibility
    a. Replacing the existing inoperable platform lift in the auditorium with a new lift
    b. Demolishing the existing two (2) administrative restrooms and creating three (3) accessible staff restrooms near the administration area.
    c. Add two (2) ADA compliant ramps from the parking lot to the school, and repainting the handicapped parking stalls with proper size and symbol designation.
    d. ADA compliant interior rooms signs throughout.

4. Safety and Esthetics
    a. Replace existing ceiling tile in classrooms and miscellaneous rooms with new ceiling tile. Ceiling grid to be reused.
        i. Kitchen ceiling is to be a washable/moisture resistant ceiling tile.
    b. New ceiling tile *and grid* in the corridors and the auditorium lobby.
        i. Auditorium lobby ceiling tile to have high STC rating for sound control.
    c. Add emergency shower/eye wash stations in the existing science rooms.
    d. Parking lot lighting.
    e. Access control is needed at all of the doors to the auditorium vestibule (8 in all) which will be connected to the existing central district system with new door hardware added.
    f. New shower fixtures in the locker rooms.

INDEPENDENT RENOVATION SCOPE

The independent renovation scopes are scopes that can be independent of other work and as such can be completed independent of each other and of the main renovation scope. The work in this budget assumes that the "Renovation" scope has been completed without repurposing of any of the existing spaces.

1. Doors and Hardware $136,891
    a. New wood doors
        i. All new interior wood doors, but excluding the wrestling and auditorium addition doors.
        ii. Reusing all existing door frames.
    b. New hardware
        a. All new hardware on new doors. Hardware should include ADA compliant levers and meet other ADA requirements such as closer speed and resistance.

2. Paint $207,596
    This work should be done prior to new floor finishes are installed but after the installation of the new doors.

a. All interior walls including the gym.
b. Paint existing door frames.

3. Floor Finishes $405,203
   a. Asbestos floor tile abatement
   b. Repair of existing floor expansion joints at underground piping trench
   c. New VCT, Carpet, Resilient Flooring and Wall Base

4. Exterior repairs $13,313
   a. Soffit and gutter repair
   b. Repair rusted exterior doors and repaint

5. Digital Upgrades $23,031
   a. Replace 25 analog cameras

6. Reception Area $13,697
   a. Demo built-in counter (not ADA compliant)
   b. Replace counter with furniture and cubicles so staff can work uninterrupted and counter at correct ADA height

7. Parking Lot $588,799
   a. Remove islands
   b. Selective demo and repair of paving (44,000 sf)
   c. Cutting curb to allow water to drain away

Total Independent Renovation Budget $1,388,530

ADDITIONS AND STEM REPURPOSING SCOPE

The new additions include the new gym excluding a walking track, the Career Technical Education (CTE) shops and a new building electric service to accommodate the additions. The repurposed spaces will accommodate new robotics lab, concession area, science rooms, at-risk classroom, math and business classrooms. The budget is segregated by CTE Addition, STEM Repurposing and the Gym Addition. This budget allocation is for informational purposes, and does not reflect the cost of dividing the additions into two separate projects.

ADDITIONS AND REPURPOSING FLOOR AREAS

CTE – Pre-Engineered Metal Building	13,000 SF	
CTE – Conventional Construction	3,300 SF	
CTE – Mezzanine	1,900 SF	
Subtotal CTE		18,200 SF
New Gym – Pre-Engineered Metal Building	9,900 SF	
New Gym – Conventional Construction	8,000 SF	
Subtotal New Gym		17,900 SF
STEM Repurposed Spaces		14,100 SF
Total		**48,300 SF**

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BUDGETS

The strategy, as shown in the attached Schematic Schedule on page 12, would be to design the Renovation scope for the entire building including spaces that potentially could be repurposed if the CTE building addition is built with the repurposed space work designated as an add Alternate in the construction documents. Once it is determined if the addition(s) can be funded, we will issue the "Renovation" construction documents for bidding either to include the alternate if funding is not available or exclude the alternate if the funding is available.

Once the amount of funding is determined, design work would then proceed on the "Additions and Repurposing" and this work would bid out as a separate project in later spring 2020.

The budgets have been divided into two scopes of the work to facilitate the funding decision making.

The first scope of work and the budget includes only the renovation work with no building additions. The Renovation portion of the budget includes work that needs to be completed together while the Independent Renovation portion includes scopes that could be separated from the Renovation scope for funding or other considerations.

RENOVATION		
Renovation (see page 9 for detail)	$4,949,916	
Independent Renovation	$1,388,530	
Total Renovation Budget		**$6,338,446**

The second scope of work and budget includes the renovations, repurposing of existing spaces and building additions.

RENOVATION, ADDITIONS, AND REPURPOSING		
Renovation	$4,949,916	
Renovation Savings if Additions are Built	($469,814)	
Subtotal Renovation if Additions are Built		$4,480,102
CTE Addition	$5,885,296	
STEM Repurposing	$2,857,084	
Subtotal STEM/CTE	$8,742,380	
Gym Addition	$5,941,026	
Subtotal Additions and Repurposing		$14,683,406
Subtotal Additions, Repurposing & Renovation (see page 10 for detail)		$19,163,508
Independent Renovation		$1,388,530
Total Renovation, Additions, and Repurposing Budget		**$20,552,038**

The assumption in the budget for the gym is that the pre-engineered metal building's exterior wall is constructed with the following materials (from the inside out);

1. Gym pads up to 10' above the finish floor with fire treated plywood behind the gym pads.
2. Structurally reinforced vapor barrier from the floor to the roof.
3. Fiberglass wall cavity insulation.
4. Exterior finishes include masonry 2'-0" high and single skin metal panel above the masonry to the building eave and rake.

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The assumption in the budget for the CTE addition is that the pre-engineered metal building's exterior wall is constructed with the following materials (from the inside out);

1. Metal liner panel to 10 feet above finish floor.
2. Structurally reinforced vapor barrier from the floor to roof.
3. Fiberglass wall cavity insulation.
4. Exterior finishes include masonry 2'-0" high and single skin metal panel above the masonry to the building eave and rake.

The roof in both the CTE and gym pre-engineered metal buildings is budgeted as standing seam metal roof with batt insulation protected on the interior side with a structurally reinforced vapor barrier. It is assumed the metal roof is structural and is spanning between purlins so no metal roof deck is needed.

Some examples of this type of construction in a gym application are shown in the following images.

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INITIAL VALUE ENGINEERING (VE) ITEMS

VE 1. Cost of seeding in lieu of sodding disturbed areas.

VE 2. Reuse the current unit ventilators for outdoor air if the retro-commission effort demonstrates that this is a workable solution. No new DOAS system, no removal of ceiling grid but still new ceiling tile everywhere. This will be studied in the design development phase and after the retro-commissioning is complete.

VE 3. Reduce width of corridor at CTE or reinforce structure of existing building which will be studied in the design development phase.

VE 4. Deleting the additional insulation in existing exterior walls which will be studied in the energy efficiency evaluation phase.

VE 5. Skylights vs other options will be studied in the design development phase.

VE 6. Emergency lights powered by generator instead of batteries, if capacity is available. Will be an add, but will save maintenance time. This will be studied in the design development phase.

VE 7 Evaluate the code requirements for a fire sprinkler system in the new CTE addition.

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Renovation Budget Detail

Budget Code	Item	Budget	Budget % of Const. Cost	Notes
100	**Development Costs**	**$ 2,502**	**0.06%**	
101	Land	$ -		N/A
102	Utility Hook-up Fees	$ -		
103	State Building Permit	$ 1,602		
104	Local Building Permit	$ 900		
200	**Construction Cost**	**$ 4,192,538**	**100.00%**	
201	Site Grading, Utilities, Paving, Landscaping	$ -		
202	Building Construction	$ 3,206,637		
203	General Insurance	$ 18,919	0.59%	
204	Construction Manager Construction Fee	$ 88,703	2.75%	CANCO
205	Design & Estimating Contingency	$ 497,139	15.00%	of const. cost
206	Construction Contingency	$ 381,140	10.00%	of const. cost
300	**Professional Fees & Expenses**	**$ 696,403**	**16.61%**	
301	A/E Prebond Services Fee	$ 42,224		DLR
302	CM Pre-bond Services Fee	$ 15,000		CANCO
303	A/E Design Services incl Const. Admin. Fee	$ 398,291	9.50%	DLR
304	Prepare SWPPP & NPDES Permit	$ -		DLR
305	Monitor & Document SWPPP	$ -		see #200
306	Arch/Eng. Reimbursable Expenses	$ 12,578		DLR
307	Printing	$ 12,578		TBD
308	CM Pre-Construction Services Fee	$ 55,000		CANCO
309	Furniture and Equipment Consultant	$ -		District personnel
310	Site Survey	$ 11,950		Snyder & Assoc.
311	Geotechnical investigation & Report	$ 10,000		TBD
312	Building Laser Scan	$ 33,339		DLR
313	HVAC Retro-Commissioning Services	$ 12,444		CANCO
314	Asbestos Survey & Testing	$ 5,000		TBD
315	Mold Testing	$ 3,000		TBD
316	3rd Party Special Inspections	$ 5,000		TBD
317	Commissioning - IECC code minimum	$ 40,000		TBD
318	Commissioning - Enhanced MEP	$ 40,000		TBD
400	**Administrative & Legal**	**$ 12,474**	**0.30%**	
401	Legal Expense	$ 10,000		
402	Administrative & Misc. Expense	$ -		None
403	Moving Expense	$ -		District personnel
404	Builder's Risk Insurance	$ 2,474		TBD
500	**Furniture, Fixtures, & Equip. (FFE)**	**$ -**	**0.00%**	
501	Furniture	$ -		
502	Lab Casework	$ -		
503	Lab Equipment	$ -		Fume Hoods in #200
504	Shop Equipment	$ -		
505	Gym & Fitness Equipment (moveable)	$ -		
506	FFE Contingency (15%)	$ -		

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Building Solutions Since 1913

Renovation Budget Detail

Budget Code	Item	Budget	Budget % of Const. Cost	Notes
600	**Technology Systems**	**$ 46,000**	**1.10%**	
601	Network switches & fire wall	$ 40,000		
602	Structured Cabling System	$ -		
603	Phone system	$ -		
604	A/V Equipment	$ -		
605	Access Control & Security Cameras	$ -		
606	Public Address/Intercom System	$ -		
607	Clocks	$ -		
608	Technology Contingency (15%)	$ 6,000		
700	**Financing Expenses**	**$ -**	**N/A**	
701	Capitalized Interest During Construction	$ -		funding will be net
702	Bond Fees	$ -		funding will be net
	Total	**$ 4,949,916**		

CARL A. NELSON & CO. NELSON
Building Solutions Since 1913

Renovation, Additions and STEM Repurposing Budget Detail

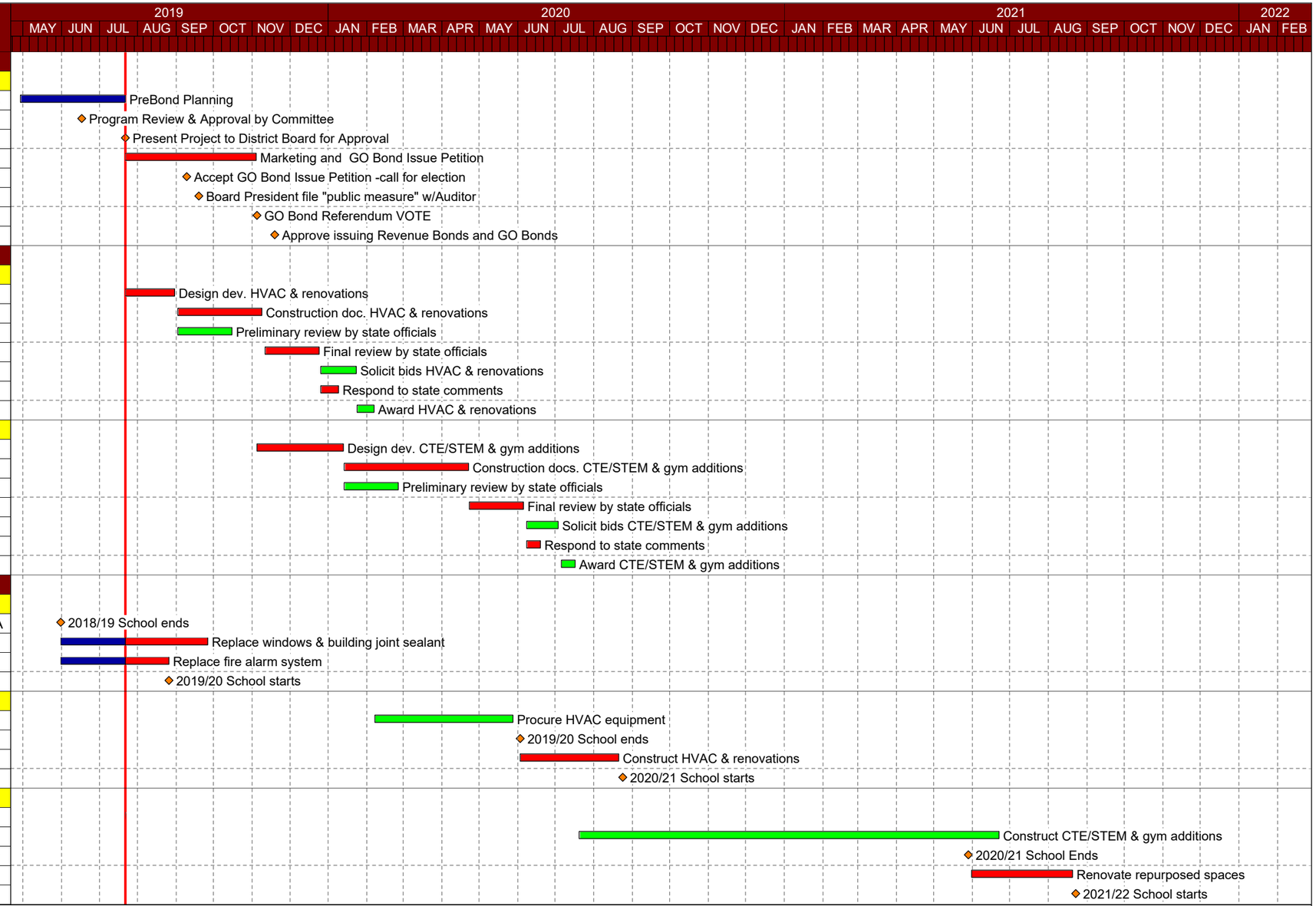
Budget Code	Item	Budget	Budget % of Const. Cost	Notes
100	**Development Costs**	**$ 57,226**	**0.35%**	
101	Land	$ -		N/A
102	Utility Hook-up Fees	$ 50,000		
103	State Building Permit	$ 6,326		
104	Local Building Permit	$ 900		
200	**Construction Cost**	**$ 16,520,115**	**100.00%**	
201	Site Grading, Utilities, Paving, Landscaping	$ 1,092,748		
202	Building Construction-Renovation	$ 2,880,535		
203	Building Construction-Repurposing	$ 1,870,803		14,100 sf @ $133/sf
204	Building Construction-CTE Addition	$ 3,516,242		18,200 sf @ $193/sf
205	Building Construction-GYM Addition	$ 3,650,409		17,900 sf @ $204/sf
206	General Insurance	$ 76,763	0.59%	
207	Construction Manager Construction Fee	$ 359,906	2.75%	CANCO
208	Design & Estimating Contingency	$ 2,017,111	15.00%	of const. cost
209	Construction Contingency	$ 1,055,597	6.39%	of const. cost
300	**Professional Fees & Expenses**	**$ 2,066,170**	**12.51%**	
301	A/E Prebond Services Fee	$ 42,224		DLR
302	CM Pre-bond Services Fee	$ 15,000		CANCO
303	A/E Design Services incl Const. Adm. Fee	$ 1,569,411	9.50%	DLR
304	Prepare SWPPP & NPDES Permit	$ 30,000		DLR
305	Monitor & Document SWPPP	$ -		see #200
306	Arch/Eng. Reimbursable Expenses	$ 50,401		DLR
307	Printing	$ 50,401		TBD
308	CM Pre-Construction Services Fee	$ 55,000		CANCO
309	Furniture and Equipment Consultant	$ -		District personnel
310	Site Survey	$ 11,950		Snyder & Assoc.
311	Geotechnical investigation & Report	$ 10,000		TBD
312	Building Laser Scan	$ 33,339		DLR
313	HVAC Retro-Commissioning Services	$ 12,444		CANCO
314	Asbestos Survey & Testing	$ 10,000		TBD
315	Mold Testing	$ 5,000		TBD
316	3rd Party Special Inspections	$ 40,000		TBD
317	Commissioning - IECC code minimum	$ 65,500		TBD
318	Commissioning - Enhanced MEP	$ 65,500		TBD
400	**Administrative & Legal**	**$ 19,747**	**0.12%**	
401	Legal Expense	$ 10,000		
402	Administrative & Misc. Expense	$ -		None
403	Moving Expense	$ -		District personnel
404	Builder's Risk Insurance	$ 9,747		TBD

CARL A. NELSON & CO. NELSON
Building Solutions Since 1913

Renovation, Additions and STEM Repurposing Budget Detail

Budget Code	Item	Budget	Budget % of Const. Cost	Notes
500	**Furniture, Fixtures, & Equip. (FFE)**	**$ 381,800**	**2.31%**	
501	Furniture	$ 70,000		STEM & CTE
502	Lab Casework	$ -		see #200
503	Lab Equipment	$ 40,000		
504	Shop Equipment	$ 150,000		
505	Gym & Fitness Equipment (moveable)	$ 72,000		fixed eq. in #200
506	FFE Contingency (15%)	$ 49,800		
600	**Technology Systems**	**$ 118,450**	**0.72%**	
601	Network switches & fire wall	$ 50,000		
602	Structured Cabling System	$ -		see #200
603	Phone system	$ 5,000		only in additions
604	A/V Equipment	$ 45,000		
605	Access Control & Security Cameras	$ -		see #200
606	Public Address/Intercom System	$ -		see #200
607	Clocks	$ 3,000		only in additions
608	Technology Contingency (15%)	$ 15,450		
700	**Financing Expenses**	**$ -**	**N/A**	
701	Capitalized Interest During Construction	$ -		funding will be net
702	Bond Fees	$ -		funding will be net
	Total	**$ 19,163,508**		

ID	Description	Work Days	Early Start	Early Finish
PreBond Planning				
1080	PreBond Planning	50	29APR19 A	22JUL19 A
1000	Program Review & Approval by Committee	0	17JUN19 A	
1040	Present Project to District Board for Approval	0	22JUL19	
1330	Marketing and GO Bond Issue Petition	76	22JUL19	04NOV19
1030	Accept GO Bond Issue Petition -call for election	0	09SEP19 *	
1060	Board President file "public measure" w/Auditor	0	19SEP19 *	
1070	GO Bond Referendum VOTE	0	05NOV19 *	
1075	Approve issuing Revenue Bonds and GO Bonds	0	19NOV19 *	
Design & Preconstruction				
HVAC & Renovation				
1270	Design dev. HVAC & renovations	30	22JUL19	30AUG19
1090	Construction doc. HVAC & renovations	50	02SEP19	08NOV19
1290	Preliminary review by state officials	32	02SEP19	15OCT19
1230	Final review by state officials	32	11NOV19	24DEC19
1110	Solicit bids HVAC & renovations	20	26DEC19	23JAN20
1300	Respond to state comments	10	26DEC19	09JAN20
1240	Award HVAC & renovations	10	24JAN20	06FEB20
CTE/STEM & Gym Additions				
1280	Design dev. CTE/STEM & gym additions	48	05NOV19	13JAN20
1120	Construction docs. CTE/STEM & gym additions	72	14JAN20	22APR20
1301	Preliminary review by state officials	32	14JAN20	26FEB20
1310	Final review by state officials	32	23APR20	05JUN20
1130	Solicit bids CTE/STEM & gym additions	20	08JUN20	03JUL20
1320	Respond to state comments	10	08JUN20	19JUN20
1250	Award CTE/STEM & gym additions	10	06JUL20	17JUL20
Construction				
Summer 2019 Misc.				
1160	2018/19 School ends	0		30MAY19 A
1010	Replace windows & building joint sealant	60	31MAY19 A	26SEP19
1020	Replace fire alarm system	60	31MAY19 A	26AUG19
1170	2019/20 School starts	0	26AUG19 *	
HVAC & Renovation				
1140	Procure HVAC equipment	80	07FEB20	28MAY20
1180	2019/20 School ends	0		02JUN20 *
1100	Construct HVAC & renovations	58	03JUN20	21AUG20
1190	2020/21 School starts	0	24AUG20 *	
CTE/STEM & Gym Additions				
1260		1	22JUL19	22JUL19
1150	Construct CTE/STEM & gym additions	240	20JUL20	22JUN21
1210	2020/21 School Ends	0		28MAY21 *
1200	Renovate repurposed spaces	60	31MAY21	20AUG21
1220	2021/22 School starts	0	23AUG21 *	



Company name	Carl A. Nelson & Co.
Data date	22JUL19
Start date	26APR19
Finish date	20AUG21
Page number	13 of 13
Number/Version	04

NELSON
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Shenandoah Community School District
High School Renovation and Addition
Project Schedule

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

July 22, 2019
Shenandoah High School
25% Schematic Budget Report

CARL A. NELSON & CO. NELSON
Building Solutions Since 1913

Renovation Alternate if Additions are Built

Budget Code	Item	Budget	Budget % of Const. Cost	Notes
100	**Development Costs**	**$ (136)**	**0.03%**	
101	Land	$ -		N/A
102	Utility Hook-up Fees	$ -		
103	State Building Permit	$ (136)		
104	Local Building Permit	$ -		
200	**Construction Cost**	**$ (426,364)**	**100.00%**	
201	Site Grading, Utilities, Paving, Landscaping	$ -		
202	Building Construction	$ (326,102)		
203	General Insurance	$ (1,924)	0.59%	
204	Construction Manager Construction Fee	$ (9,021)	2.75%	CANCO
205	Design & Estimating Contingency	$ (50,557)	15.00%	of const. cost
206	Construction Contingency	$ (38,760)	10.00%	of const. cost
300	**Professional Fees & Expenses**	**$ (43,063)**	**10.10%**	
301	A/E Prebond Services Fee	$ -		DLR
302	CM Pre-bond Services Fee	$ -		CANCO
303	A/E Design Services incl Const. Admin. Fee	$ (40,505)	9.50%	DLR
304	Prepare SWPPP & NPDES Permit	$ -		DLR
305	Monitor & Document SWPPP	$ -		see #200
306	Arch/Eng. Reimbursable Expenses	$ (1,279)		DLR
307	Printing	$ (1,279)		TBD
308	CM Pre-Construction Services Fee	$ -		CANCO
309	Furniture and Equipment Consultant	$ -		District personnel
310	Site Survey	$ -		Snyder & Assoc.
311	Geotechnical investigation & Report	$ -		TBD
312	Building Laser Scan	$ -		DLR
313	HVAC Retro-Commissioning Services	$ -		CANCO
314	Asbestos Survey & Testing	$ -		TBD
315	Mold Testing	$ -		TBD
316	3rd Party Special Inspections	$ -		TBD
317	Commissioning - IECC code minimum	$ -		TBD
318	Commissioning - Enhanced MEP	$ -		TBD
400	**Administrative & Legal**	**$ (252)**	**0.06%**	
401	Legal Expense	$ -		
402	Administrative & Misc. Expense	$ -		None
403	Moving Expense	$ -		District personnel
404	Builder's Risk Insurance	$ (252)		TBD
500	**Furniture, Fixtures, & Equip. (FFE)**	**$ -**	**0.00%**	
501	Furniture	$ -		STEM & CTE
502	Lab Casework	$ -		see #200
503	Lab Equipment	$ -		
504	Shop Equipment	$ -		
505	Gym & Fitness Equipment (moveable)	$ -		fixed eq. in #200
506	FFE Contingency (15%)	$ -		

July 22, 2019
Shenandoah High School
25% Schematic Budget Report

CARL A. NELSON & CO. NELSON
Building Solutions Since 1913

Renovation Alternate if Additions are Built

Budget Code	Item	Budget	Budget % of Const. Cost	Notes
600	**Technology Systems**	**$ -**	**0.00%**	
601	Network switches & fire wall	$ -		
602	Structured Cabling System	$ -		see #200
603	Phone system	$ -		only in additions
604	A/V Equipment	$ -		
605	Access Control & Security Cameras	$ -		see #200
606	Public Address/Intercom System	$ -		see #200
607	Clocks	$ -		only in additions
608	Technology Contingency (15%)	$ -		
700	**Financing Expenses**	**$ -**	**N/A**	
701	Capitalized Interest During Construction	$ -		funding will be net
702	Bond Fees	$ -		funding will be net
	Total	**$ (469,815)**		

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
Alternate						
	7		General Construction			
		Classrooms, Mis				
			Demolish ceiling tile only	5,948 sf	0.50 /sf	2,974
			Install new ceiling tile	5,948 sf	1.50 /sf	8,922
			Classrooms, Mis			11,896
		Ext. Insulation				
			Remove Slab on Grade - for new location of unit ventilators	90 cf	19.08 /cf	1,717
			S.O.G. Conc 4000psi	1 cy	184.12 /cy	184
			Window Stools (Solid Surface) - large windows	32 lf	29.31 /lf	938
			Sound Blanket 16" x 3- 5/8"	67 sf	0.70 /sf	46
			Sprayed On Insulation	1,122 sf	4.58 /sf	5,136
			S Stud 358 x 20 ga - LF	4,716 lf	1.90 /lf	8,939
			S Stud 358 x 20 ga - LF	162 lf	1.90 /lf	307
			Std Track 20 ga 3 5/8"	826 lf	1.61 /lf	1,333
			Labor GWB Finish All Steps	1,875 sf	1.16 /sf	2,176
			Paint Interior Complete	2,321 sf	1.25 /sf	2,901
			Ext. Insulation			23,677
		General				
			Room Signs existing CTE	15 ea	169.22 /ea	2,538
			General			2,538
		New DOAS				
			Reinforce roof structure for DOAS units science	1 ea	4,049.28 /ea	4,049
			Patch roof membrane for DOAS units science	1 ea	1,000.00 /ea	1,000
			New DOAS			5,049
		Science				
			New Fume Hood	2 ea	4,906.77 /ea	9,814
			New Fume Hood roof patch	2 ea	251.06 /ea	502
			Science			10,316
			7 General Construction		/sf	53,477
	10		Plumbing			
		Science				
			Hook up fume hoods	2 ea	1,500.00 /ea	3,000
			Emergency shower/eye wash	2 ea	4,500.00 /ea	9,000
			Natural gas piping to DOAS science	1 ea	3,500.00 /ea	3,500
			Science			15,500
			10 Plumbing			15,500
	11		Mechanical			
		Ext. Insulation				
			Disconnect and reset Unit ventilators for wall furring	8 ea	2,000.00 /ea	16,000
			Ext. Insulation			16,000
		New DOAS				
			New DOAS AHU science 4,000 cfm	1 ea	40,000.00 /ea	40,000
			Ductwork/diffusers science (no insul)	1 ls	8,000.00 /ls	8,000
			DOAS controls science	1 ea	10,000.00 /ea	10,000
			New DOAS			58,000
		Science				
			Fume Hood duct	2 ea	2,000.00 /ea	4,000
			Fume Hood fan	2 ea	3,000.00 /ea	6,000
			Science			10,000
		Unit Ventilator				
			Unit ventilator new control module & thermostat	8 ea	2,500.00 /ea	20,000
			Unit Ventilator			20,000
			11 Mechanical		/sf	104,000
	12		Electrical			
		Conv power				
			New convenience receptacles (2 per classroom)	10 ea	300.00 /ea	3,000
			Conv power			3,000
		Data Network				
			New structured cabling	14,000 sf	2.00 /sf	28,000
			Data Network			28,000
		Ext. Insulation				
			Disconnect and reset Unit ventilators for wall furring	1 ea	250.00 /ea	250
			Ext. Insulation			250
		Lighting Contrl				
			Lighting control	13,244 sf	2.00 /sf	26,488

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
			Lighting Contrl			26,488
		New DOAS				
			Wire new DOAS units science	1 ea	4,500.00 /ea	4,500
			New DOAS			4,500
		New LED Lights				
			Demolish light fixtures - recessed lights (hard clg)	318 sf	7.81 /sf	2,484
			Demolish light fixtures - troffers (in ACP)	8,199 sf	1.00 /sf	8,199
			Demolish light fixtures - exposed struct area	4,727 sf	1.00 /sf	4,727
			New LED light fixtures (troffers) (in ACP and Hrd Clg)	8,517 sf	5.52 /sf	47,042
			New LED light fixtures (exposed ceiling area)	4,727 sf	6.02 /sf	28,435
			New LED Lights			90,887
			12 Electrical		/sf	153,125
			Alternate			**326,102**
Base			**Base**			
	0		General Conditions (CM)			
		General				
			Superintendent	16 wk	5,000.00 /wk	80,000
			Project Manager - Project Management	16 wk	5,000.00 /wk	80,000
			Project Manager - Bidding	4 wk	5,000.00 /wk	20,000
			Project Executive	4 wk	5,600.01 /wk	22,400
			Field Engineer	8 wk	3,300.00 /wk	26,400
			PM Hotel/food	20 day	177.71 /day	3,554
			Car Travel	16 trip	304.65 /trip	4,874
			Superintendent Subsistence - 7 Nights (Over 250 miles)	16 week	700.00 /week	11,200
			Waste Disposal	50 dump	660.08 /dump	33,004
			Superintendent Pick-up	16 wk	300.00 /wk	4,800
			Supt Truck/Fuel	16 wk	152.33 /wk	2,437
			Cell phone	4 mo	152.33 /mo	609
			Copy machine	4 mo	152.33 /mo	609
			Office supplies	4 mo	203.10 /mo	812
			Overnight mail	4 mo	101.55 /mo	406
			Personal computer	4 mo	50.78 /mo	203
			Worksafe Program	1 ls	1,500.00 /ls	1,500
			Final cleanup	1 ls	25,000.00 /ls	25,000
			Const signage	1 ls	1,015.50 /ls	1,016
			Misc expendables	4 mo	203.10 /mo	812
			Trailer Hauling/setup	1 ls	3,000.00 /ls	3,000
			Office trailer	4 mo	800.00 /mo	3,200
			General			325,838
			0 General Conditions (CM)		/****	325,838
	1		Sitework & Site Utilities			
		* unassigned *				
			Sitework & Site Utilities	***1 ls***	***/ls***	
	2		Paving and Surfacing			
		* unassigned *				
			Paving and Surfacing	***1 ls***	***/ls***	
	3		Concrete Fnd and Flrs - See BP7			
		* unassigned *				
			Concrete Foundations and Floors	***1 ls***	***/ls***	
	4		Masonry			
		* unassigned *				
			Masonry	***1 ls***	***/ls***	
	5		Structure and PEMB			
		* unassigned *				
			Structure and PEMB	***1 ls***	***/ls***	
	6		Roof			
		* unassigned *				
			Roof	***1 ls***	***/ls***	
	7		General Construction			
		ADA Ext. Ramp				
			Remove Slab on Grade	143 cf	19.08 /cf	2,728
			Excavate Footing By Machine	203 cy	9.79 /cy	1,986
			Shape & Grade Footing	318 sf	0.36 /sf	116

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
		ADA Ext. Ramp				
			Backfill Footings - Existing Material	133 cy	10.54 /cy	1,398
			Detectable Warning Surface	20 sf	24.45 /sf	489
			Parking Lines	150 lf	0.67 /lf	100
			Handicap Symbols	4 ea	80.08 /ea	320
			Paint Curbs	50 lf	0.67 /lf	33
			Footing Forms - SF	259 sf	5.47 /sf	1,415
			Wall Forms - Patent System*	1,270 sf	8.52 /sf	10,815
			Footing Rebar #5	382 lf	1.28 /lf	489
			Wall Rebar #5	1,334 lf	1.28 /lf	1,707
			Footing Conc 4000 psi	12 cy	184.13 /cy	2,165
			Wall Conc 4000 psi	16 cy	184.13 /cy	2,887
			Walk Conc 2500 psi	13 cy	184.13 /cy	2,394
			Rub Finish	508 sf	1.11 /sf	564
			Ext. Ramp Railing	127 lf	84.98 /lf	10,792
			ADA Ext. Ramp			**40,399**
		ADA Lift				
			Platform Lifts	1 ea	15,232.50 /ea	15,233
			ADA Lift			**15,233**
		Admin Restrm				
			Demolition - Interior Complete	288 sf	18.83 /sf	5,422
			Patch CMU	1 ls	5,000.00 /ls	5,000
			S.O.G. Conc 4000psi	4 cy	184.13 /cy	737
			Sound Blanket 16" x 3- 5/8"	804 sf	0.79 /sf	634
			Caulk & Sealants - Hollow Metal Frames	175 lf	1.31 /lf	229
			Metal Frames - Single	5 ea	290.53 /ea	1,453
			Install Wood Door	5 ea	286.47 /ea	1,432
			Finishing Hardware (all Types)	5 ea	425.27 /ea	2,126
			S Stud 358 x 13' 20 ga	13 ea	6.34 /ea	82
			S Stud 358 x 20 ga - LF	876 lf	1.90 /lf	1,660
			S Stud 358 x 20 ga - LF	96 lf	1.90 /lf	182
			Std Track 20 ga 3 5/8"	174 lf	1.61 /lf	281
			Std Track 20 ga 3-5/8"	24 lf	1.61 /lf	39
			Drywall Acoustical Sealant	122 lf	0.92 /lf	112
			Sharp Pt Screw 7/16"	52 ea	0.06 /ea	3
			Sharp Pt Screw 1 1/8"	195 ea	0.05 /ea	10
			GWB 5/8x10 Fire Code	1,100 sf	1.51 /sf	1,658
			GWB 5/8x12 Regular	156 sf	1.37 /sf	213
			GWB 5/8x10 Water Resistant	120 sf	1.37 /sf	164
			Labor GWB Finish All Steps	1,098 sf	1.16 /sf	1,274
			Labor GWB Ceiling Finish	156 sf	1.16 /sf	181
			Joint Compound	156 sf	0.02 /sf	3
			Joint Tape 500' Rolls	156 sf	0.01 /sf	1
			Ceramic Tile Floor Grade 1	388 sf	7.78 /sf	3,018
			Ceramic Tile Wall Grade 1 - water wall only	216 sf	7.78 /sf	1,680
			Install new ceiling tile and grid	300 sf	3.00 /sf	900
			Paint Interior Complete	1,200 sf	1.25 /sf	1,500
			Paint HM Door Frame	5 ea	94.63 /ea	473
			Soap Dispenser	3 ea	68.92 /ea	207
			Mirror	3 ea	154.35 /ea	463
			Grab Bar	6 ea	72.70 /ea	436
			Towel Dispenser	3 ea	93.01 /ea	279
			Toilet Paper Holder	3 ea	102.36 /ea	307
			Admin Restrm			**32,158**
		Auditorium				
			Demolish ACT tile and grid	860 sf	0.75 /sf	645
			Card Key Locking Hardware	8 ea	3,761.63 /ea	30,093
			Install new ceiling tile STC rated and grid	860 sf	3.50 /sf	3,010
			Auditorium			**33,748**
		Classrooms, Mis				
			Demolish ceiling tile only	22,740 sf	0.50 /sf	11,370
			Install new ceiling tile	21,883 sf	1.50 /sf	32,825
			Install new ceiling tile - Recept.	477 sf	1.50 /sf	716
			Classrooms, Mis			**44,910**
		Corridor				
			Demolish ACT tile and grid	11,469 sf	0.75 /sf	8,602
			Corridor			**8,602**
		Data Comm				

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
		Data Comm				
			Data Comm Room	1 ls	4,000.00 /ls	4,000
			Data Comm			**4,000**
		Ext. Insulation				
			Remove Slab on Grade - for new location of unit ventilators	260 cf	19.08 /cf	4,961
			S.O.G. Conc 4000psi	3 cy	184.13 /cy	598
			Window Stools (Solid Surface) - large windows	300 lf	29.31 /lf	8,794
			Window Stools (Solid Surface) - 2' windows	108 lf	29.31 /lf	3,166
			Sprayed On Insulation	9,250 sf	4.58 /sf	42,341
			S Stud 358 x 20 ga - LF	10,845 lf	1.90 /lf	20,555
			S Stud 358 x 20 ga - LF	72 lf	1.90 /lf	136
			Std Track 20 ga 3 5/8"	2,346 lf	1.61 /lf	3,786
			Labor GWB Finish All Steps	10,377 sf	1.16 /sf	12,041
			Cast Tegulr Std 2x2 5/8" - Cut the tile to fit.	1,020 sf	3.00 /sf	3,060
			Floor Resil Base	1,020 lf	1.88 /lf	1,914
			Paint Interior Complete	7,561 sf	1.25 /sf	9,451
			Ext. Insulation			**110,804**
		General				
			Interior Door Signage	78 ea	169.22 /ea	13,199
			General			**13,199**
		HVAC				
			Chiller foundation	1 ea	2,500.00 /ea	2,500
			Boiler & pump pads	6 ea	800.00 /ea	4,800
			HVAC			**7,300**
		Kitchen				
			Demolish ceiling tile only	1,297 sf	0.50 /sf	649
			Install new ceiling tile (washable)	1,297 sf	2.00 /sf	2,594
			Kitchen			**3,243**
		New DOAS				
			Reinforce roof structure for DOAS units locker rooms	1 ea	4,049.29 /ea	4,049
			Patch roof membrane for DOAS units locker rooms	1 ea	1,000.00 /ea	1,000
			Patch roof membrane for demo of EF locker rooms	4 ea	250.00 /ea	1,000
			Patch roof structure for demo of EF locker rooms	4 ea	692.89 /ea	2,772
			New DOAS			**8,821**
			7 General Construction		**/sf**	**322,416**
	8		**Ceilings - See Bid Item 7**			
		* unassigned *				
			Ceilings	***1 ls***	***/ls***	
	9		**Flooring - See Bid Item 7**			
		* unassigned *				
			Flooring	***1 ls***	***/ls***	
	10		**Plumbing**			
		HVAC				
			Condensate from fan coils	2 ea	1,000.00 /ea	2,000
			HVAC			**2,000**
		Locker Rooms				
			Upgrade showers	6 ea	6,000.00 /ea	36,000
			Natural gas piping to DOAS locker rooms	6 ea	3,500.00 /ea	21,000
			Locker Rooms			**57,000**
		Staff toilets				
			Plumbing Fixtures wc incl all pipe	3 ea	3,500.00 /ea	10,500
			Plumbing Fixtures lav incl all pipe	3 ea	3,500.00 /ea	10,500
			Staff toilets			**21,000**
			10 Plumbing			**80,000**
	11		**Mechanical**			
		Central Plant				
			Demo boilers, chillers, pumps & piping	1 ls	10,000.00 /ls	10,000
			3,000 MBH Condensing Boilers	2 ea	80,000.00 /ea	160,000
			200 ton air cooled chiller	1 ea	150,000.00 /ea	150,000
			600 GMP chilled water pumps	2 ea	6,000.00 /ea	12,000
			860 GMP hot water pumps	2 ea	9,000.00 /ea	18,000
			Primary hot water pumps	2 ea	5,000.00 /ea	10,000
			Primary chilled water pumps	2 ea	5,000.00 /ea	10,000
			HVAC Controls for central plant	1 ls	35,000.00 /ls	35,000
			Hydronic pipe and insulation for central plant	1 ls	100,000.00 /ls	100,000
			Testing & Balancing all HVAC except classroom DOAS	1 ls	50,000.00 /ls	50,000

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
		Central Plant				
			Asbestos abatement	1 ls	10,000.00 /ls	10,000
			New HVAC BACnet control network wiring	1 ls	25,000.00 /ls	25,000
			Central Plant			590,000
		Data/com				
			Install fan coil cooling units	2 ea	5,000.00 /ea	10,000
			Install fan coil cooling unit hydronic pipe and insulation	2 ea	2,500.00 /ea	5,000
			Install fan coil cooling unit controls	2 ea	1,500.00 /ea	3,000
			Data/com			18,000
		Ext. Insulation				
			Disconnect and reset Unit ventilators for wall furring	26 ea	2,000.00 /ea	52,000
			Ext. Insulation			52,000
		New DOAS				
			Demo of EF locker rooms	4 ea	250.00 /ea	1,000
			New DOAS AHU locker room 2,000 cfm	1 ea	20,000.00 /ea	20,000
			Ductwork/diffusers (exposed) locker rooms (no insul)	1 ls	10,000.00 /ls	10,000
			DOAS controls locker rooms	1 ea	10,000.00 /ea	10,000
			New DOAS			41,000
		Unit Ventilator				
			Unit ventilator new control module & thermostat	35 ea	2,500.00 /ea	87,500
			Unit Ventilator			87,500
			11 Mechanical		/sf	788,500
	12		Electrical			
		ADA Lift				
			Unhook & reconnect ADA lift	1 ea	500.00 /ea	500
			ADA Lift			500
		Conv power				
			New convenience receptacles (2 per classroom)	40 ea	300.00 /ea	12,000
			New staff toilet worik	1 ls	2,500.00 /ls	2,500
			Conv power			14,500
		Data Network				
			New structured cabling, racks	80,000 sf	2.00 /sf	160,000
			Demolish all existing data wire	1 ls	25,000.00 /ls	25,000
			New data service	1 ls	10,000.00 /ls	10,000
			Racks, tracks & runways	2 ea	20,000.00 /ea	40,000
			Data Network			235,000
		Ext. Insulation				
			Disconnect and reset Unit ventilators for wall furring	35 ea	250.00 /ea	8,750
			Ext. Insulation			8,750
		HVAC				
			Wire new chiller	1 ea	4,500.00 /ea	4,500
			Wire new pumps	8 ea	2,500.00 /ea	20,000
			New pump VFD 25 hp	2 ea	6,000.00 /ea	12,000
			New pump VFD 50 hp	2 ea	9,000.00 /ea	18,000
			New pump FVNR starters	4 ea	2,000.00 /ea	8,000
			Wire new fume hoods	2 ea	2,000.00 /ea	4,000
			Wire data/com FCU	2 ea	2,000.00 /ea	4,000
			HVAC			70,500
		Intercom				
			Replace Intercom system	1 ls	30,000.00 /ls	30,000
			Intercom			30,000
		Lighting Contrl				
			Lighting control	47,122 sf	2.00 /sf	94,244
			Lighting Contrl			94,244
		New DOAS				
			Demo of EF locker rooms	4 ea	250.00 /ea	1,000
			Wire new DOAS units locker rooms	1 ea	4,500.00 /ea	4,500
			New DOAS			5,500
		New LED Lights				
			Demolish light fixtures - troffers (in ACP)	37,397 sf	1.00 /sf	37,397
			Demolish light fixtures - recessed (hard clg)	4,619 sf	1.00 /sf	4,619
			Demolish light fixtures auditorium lobby and vestibule	1,182 sf	1.00 /sf	1,182
			Demolish light fixtures - exposed struct. area	3,924 sf	1.00 /sf	3,924
			New LED light fixtures (troffers) (in ACP and Hrd Clg)	39,543 sf	5.52 /sf	218,406
			New LED light fixtures (linear) (cafeteria)	2,473 sf	12.54 /sf	31,008
			New LED light fixtures (can lights) (auditorium lobby)	1,182 sf	11.52 /sf	13,620
			New LED light fixtures (exposed ceiling area)	3,924 sf	6.02 /sf	23,605

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
		New LED Lights				
			Lighting - Emergency w/ battery	54 ea	603.88 /ea	32,609
			Lighting - Emergency w/ battery	10 ea	603.88 /ea	6,039
			New exit signs	50 ea	503.88 /ea	25,194
			New LED Lights			397,603
		Panelboards				
			Replace panelboards	10 ea	6,000.00 /ea	60,000
			Panelboards			60,000
		Security				
			Door control	8 ea	2,500.00 /ea	20,000
			Security			20,000
		Site lighting				
			Parking lot light poles	15 ea	3,000.00 /ea	45,000
			Conduit & wire to light poles	1 ls	15,000.00 /ls	15,000
			Parking lot light pole bases	15 ea	1,500.00 /ea	22,500
			Site lighting			82,500
			12 Electrical		/sf	1,019,097
			Base Base			**2,535,851**
DOAS VE						
	7		General Construction			
		Corridor				
			Install new ceiling tile and grid	11,469 sf	3.00 /sf	34,407
			Corridor			34,407
		New DOAS				
			Reinforce roof structure for DOAS units classroom	3 ea	4,049.30 /ea	12,148
			Patch roof membrane for DOAS units classroom	3 ea	1,000.00 /ea	3,000
			Patch roof structure for demo of relief/EF/OA	10 ea	692.88 /ea	6,929
			Patch roof membrane for demo of relief/EF/OA	10 ea	250.00 /ea	2,500
			New DOAS			24,577
			7 General Construction		/sf	58,984
	10		Plumbing			
		HVAC				
			Natural gas piping to DOAS class rooms	3 ea	3,500.00 /ea	10,500
			HVAC			10,500
			10 Plumbing			10,500
	11		Mechanical			
		Central Plant				
			Testing & Balancing classroom DOAS	1 ls	24,000.00 /ls	24,000
			Central Plant			24,000
		New DOAS				
			Demo of relief/EF/OA	10 ea	250.00 /ea	2,500
			New DOAS AHUs classrooms 3,000 cfm	3 ea	30,000.00 /ea	90,000
			Ductwork/diffusers classrooms (no insul)	1 ls	100,000.00 /ls	100,000
			DOAS controls classrooms	3 ea	10,000.00 /ea	30,000
			New DOAS			222,500
		Unit Ventilator				
			Modification to current Unit Ventilators -Blank off OA openings	26 ea	300.00 /ea	7,800
			Modification to current Unit Ventilators - Blank off OA openings	8 ea	300.00 /ea	2,400
			Unit Ventilator			10,200
			11 Mechanical		/sf	256,700
	12		Electrical			
		New DOAS				
			Demo of EF	4 ea	250.00 /ea	1,000
			Wire new DOAS units classrooms	3 ea	4,500.00 /ea	13,500
			Fire alarm - remove and reinstall in corridors	1 ls	4,000.00 /ls	4,000
			New DOAS			18,500
			12 Electrical		/sf	18,500
			DOAS VE			**344,684**
* unassigned *						
	13					
		* unassigned *				
				1 ls	***/ls***	

Sort Order	Bid Item	Location	Description	Takeoff Quantity	Grand Total Unit Price	Grand Total
	14					
		* unassigned *				
				1 ls	/ls	
	15					
		* unassigned *				
				1 ls	/ls	
	16					
		* unassigned *				
				1 ls	/ls	
	17					
		* unassigned *				
				1 ls	/ls	
	18					
		* unassigned *				
				1 ls	/ls	

Total $3,206,637

SECTION 000110 – TABLE OF CONTENTS – VOLUME I OF II

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 – GENERAL REQUIREMENTS

DIVISION 02 – EXISTING CONDITIONS – NOT USED

SECTION 000110 – TABLE OF CONTENTS – VOLUME II OF II

9.0 Building Design Attachments

A. See attached Design Development Drawings

SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

1000 MUSTANG DR
SHENANDOAH, IA 51601

DESIGN DEVELOPMENT

INDEX OF DRAWINGS

SEPTEMBER 25, 2019

SHENANDOAH HIGH SCHOOL RENOVATIONS
SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT
09-25-19
Revisions

11-16116-20

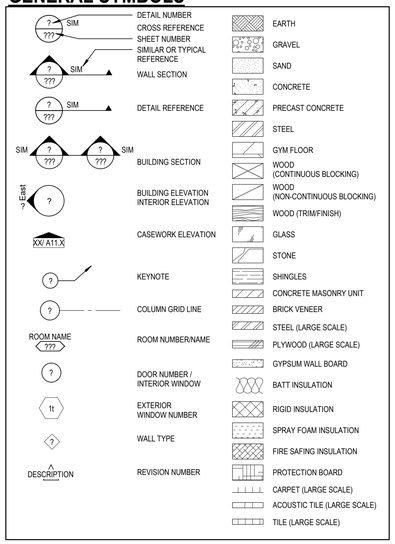
COVER SHEET

0.0

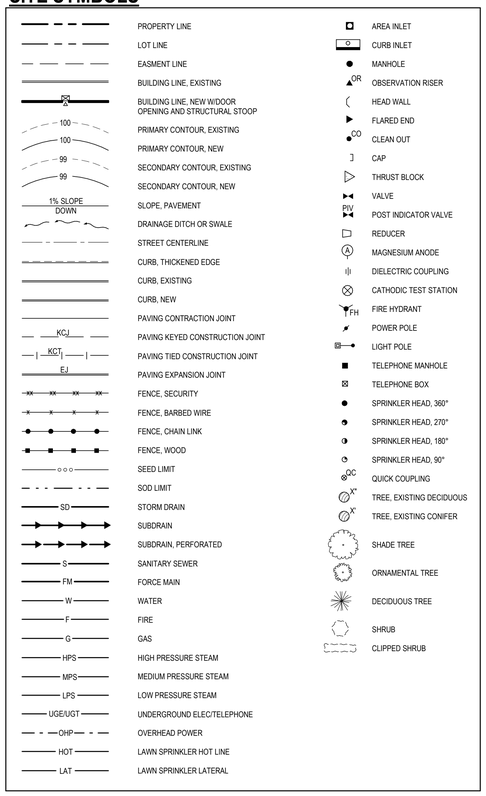
ABBREVIATIONS

#	NUMBER	EWC	ELECTRIC WATER COOLER	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION	UR	URINAL
&	AND	EXIST	EXISTING	NIC	NOT IN CONTRACT	US	UTILITY SHELF
@	AT	EXP	EXPANSION	NOM	NOMINAL	UTIL	UTILITY
		EXP	EXPOSED	NTS	NOT TO SCALE		
AB	ANCHOR BOLT	EXT	EXTERIOR	NWC	NORMAL WEIGHT CONCRETE	VB	VAPOR BARRIER
AB	AIR BARRIER					VB	VINYL BASE
ABS	ASBESTOS	F	FABRIC	O to O	OUT TO OUT	VCB	VENTED COVE BASE
ACC	ADA ACCESSIBLE	F.O.	FACE OF	OA	OVERALL	VERT	VERTICAL
ACR	ACRYLIC	F.V.	FIELD VERIFY	OC	ON CENTER	VEST	VESTIBULE
AD	ACCESS DOOR	FAB	FABRICATE(D)	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED	VF	VINYL FLOOR
ADA	AMERICANS WITH DISABILITY ACT	FB	FACE BRICK	OFF	OFFICE	VOC	VOLITILE ORGANIC COMPOUND
ADDN	ADDITION OR ADDITIONAL	FD	FLOOR DRAIN	OFOI	OWNER FURNISHED OWNER INSTALLED	VOL	VOLUME
ADJ	ADJUSTABLE	FDN	FOUNDATION	OPG(S)	OPENING(S)	VP	VENEER PLASTER
ADJT	ADJACENT	FE	FIRE EXTINGUISHER	OPP	OPPOSITE	VT	VINYL TILE
ADMIN	ADMINISTRATION	FEC	FIRE EXTINGUISHER CABINET	OSHA	OPERATIONAL SAFETY AND HEALTH ADMINISTRATION	VWC	VINYL WALL COVERING
AEC	AUTOMATED EXTERNAL DEFIBRILLATIORS	FF	FINISH FLOOR	OTB	OPEN TO BELOW		
AFF	ABOVE FINISHED FLOOR	FH	FIRE HYDRANT	OVFL	OVERFLOW	W	WEST
AFG	ABOVE FINISHED GRADE	FHC	FIRE HOSE CABINET	OVHD	OVERHEAD	W	WIDE
AHJ	AUTHORITY HAVING JURISDICTION	FIG	FIGURE			W/	WITH
AL	ALUMINUM	FIN	FINISHED	P	PAINT	W/O	WITHOUT
ALT	ALTERNATE	FIX	FIXTURE	PAN B	PANIC BOLT	WB	WALL BASE
ALUM	ALUMINUM	FL	FLOOR	PAR	PARALLEL	WC	WATER CLOSET
ANCH	ANCHOR	FLASH	FLASHING	PB	PARTICLE BOARD	WC	WALL COVERING
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	FLEX	FLEXIBLE	PC	PRECAST CONCRETE	WCL	WATER CLOSET/LAVATORY COMBINATION
AP	ACCESS PANEL	FLG	FLOORING	PCD	PAPER CUP DISPENSER	WD	WOOD
APC	ACOUSTIC PANEL CEILING	FLM	FULL LENGTH MIRROR	PCT	PORCELAIN CERAMIC TILE	WDF	WOOD FLOORING
APPROX	APPROXIMATE	FLUOR	FLUORESCENT	PD	PANIC DEVICE	WDW	WINDOW
ARCH	ARCHITECTURAL	FO	FINISH OPENING	PENT	PENTHOUSE	WG	POLISHED WIRE GLASS
ASPH	ASPHALT	FOC	FACE OF CONCRETE	PERF	PERFORATED	WI	WROUGHT IRON
AUTO	AUTOMATIC	FOF	FACE OF FINISH	PERP	PERPENDICULAR	WOM	WALK OFF MAT
AVG	AVERAGE	FOM	FACE OF MASONRY	PG	PATTERN GLASS	WR	WASTE RECEPTACLE
AWP	ACOUSTIC WALL PANEL	FOS	FACE OF STUD	PIC	PORTABLE INSTRUMENT CONNECTION	WRB	WEATHER RESISTANT BARRIER
		FOW	FACE OF WALL	PIG	PATTERN INSULATING GLASS	WW	WARM WHITE
B.O.	BOTTOM OF	FP	FIREPROOFING	PL	PLATE	WWF	WELDED WIRE FABRIC
BCS	BABY CHANGING STATION	FR	FIRE RESISTANT	PL	PROPERTY LINE		
BD	BOARD	FRP	FIBERGLASS REINFORCED PANEL	PL	PLASTIC LAMINATE	YD	YARD
BLDG	BUILDING	FRT	FIRE RESISTANCE TREATED	PLAM	PLASTIC LAMINATE		
BLK	BLOCK	FS	FLOOR SINK	PLBG	PLUMBING		
BLKG	BLOCKING	FSS	FOLDING SHOWER SEAT	PLYWD	PLYWOOD		
BLKHD	BULKHEAD	FT	FEET	PR	PAIR		
BM(S)	BEAM(S)	FTG	FOOTING	PREFAB	PREFABRICATED		
BOT	BOTTOM	FUT	FUTURE	PROJ	PROJECT(OR) (ION)		
BRDG	BRIDGING	FVC	FIRE VALVE CABINET	PS	PROJECTION SCREEN		
BRG	BEARING	FWC	FABRIC WALL COVERING	PT	POINT		
BRKT	BRACKET			PTD	PAPER TOWEL DISPENSER		
BSMT	BASEMENT	G	GROUT	PTD/R	COMBINATION TOWEL DISPENSER/RECEPTACLE		
BT	BATHTUB	GA	GAUGE	PTN	PARTITION		
BTWN	BETWEEN	GAL	GALLON	PVC	POLYVINYL CHLORIDE		
		GALV	GALVANIZED	PWL	SOUND POWER LEVEL		
C	CHANNEL	GB	GRAB BAR				
CAB	CABINET	GC	GENERAL CONTRACTOR	QT	QUARRY TILE		
CANT	CANTILEVER	GD	GARBAGE DISPOSAL	QTR RND	QUARTER ROUND		
CAP	CAPACITY	GEN	GENERAL	QTY	QUANTITY		
CBD	CHALKBOARD	GFA	GROSS FLOOR AREA				
CER	CERAMIC	GL	GLUE LAMINATED	RAD	RADIUS		
CF	CUBIC FEET	GL	GLASS	RB	RUBBER BASE		
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GMP	GUARANTTED MAXIMUM PRICE	RC	REMOTE CONTROL		
CFSF	COLD-FORMED STEEL FRAMING	GOVT	GOVERNMENT	RCP	REFLECTED CEILING PLAN		
CG	CLEAR FLOAT GLASS	GR	GUARD RAIL	RD	ROOF DRAIN		
CI	CAST IRON	GR	GRADE	REF	REFERENCE		
CIG	CLEAR INSULATING GLASS	GRS	GALVANIZED RIGID STEEL	REFL	REFLECTED		
CIP	CAST IN PLACE	GWB	GYPSUM WALL BOARD	REM	REMOVABLE		
CJ	CONTROL JOINT	GYP	GYPSUM	REQ(D)	REQUIRE(D)		
CJA	CONTROL JOINT ABOVE			RESIL	RESILIENT		
CL	CENTER LINE	H	HEIGHT	REV	REVISION(S)		
CLG	CEILING	HC	HOLLOW CORE	RF	RESILIENT FLOORING		
CLOS	CLOSET	HD	HAND DRYER	RF	RUBBER FLOOR		
CLR	CLEAR	HDBD	HARDBOARD	RFM	RECESSED FLOOR MAT		
CMU	CONCRETE MASONRY UNIT	HDR	HEADER	RH	ROBE HOOK		
COL	COLUMN	HDWD	HARDWOOD	RI&C	ROUGH IN AND CONNECT		
COM	COMMON	HDWR	HARDWARE	RM	ROOM		
COMB	COMBINATION	HM	HOLLOW METAL	RND	ROUND		
COMM	COMMUNICATIONS	HORIZ	HORIZONTAL				
COMPR	COMPRESSIBLE	HR	HOUR	S	SOUTH		
CONC	CONCRETE	HR	HANDRAIL	S	SINK		
CONF	CONFERENCE	HS	HARDWARE SET	SAT	SPRAYED ACOUSTIC TREATMENT		
CONFIG	CONFIGURATION	HSS	HOLLOW STRUCTURAL SHAPE	SAW	SOUND ABSORBING WALL UNITS		
CONN(S)	CONNECTION(S)	HVAC	HEATING VENTILATING AND AIR CONDITIONING	SB	SPLASH BLOCK		
CONST	CONSTRUCTION			SC	SOLID CORE		
CONT	CONTINUOUS	i.e.	THAT IS	SC	SHOWER CURTAIN		
CONTR	CONTRACT(OR)	IAW	IN ACCORDANCE WITH	SCD	SEAT COVER DISPENSER		
CORR	CORRIDOR	IBC	INTERNATIONAL BUIDLING CODE	SCH	SHOWER CURTAIN HOOK		
CP	COVER PLATE	ID	INSIDE DIAMETER	SCHED	SCHEDULE		
CPT	CARPET	IF	INSIDE FACE	SCR	SHOWER CURTAIN ROD		
CR	CHAIR RAIL	IJ	ISOLATION JOINT	SCT	STRUCTURAL CLAY TILE		
CS	COUNTERSINK	IJS	IN JOIST SPACE	SD	SOAP DISPENSER		
CSTJ	CONSTRUCTION JOINT	IN	INCH	SECT	SECTION		
CSWK	CASEWORK	INC	INCLUDE(ING)	SECY	SECRETARY		
CT	CERAMIC TILE	INSUL	INSULATION	SG	SPANDRAL GLASS		
CTG	CLEAR TEMPERED FLOAT GLASS	INT	INTERIOR	SGL	SINGLE		
CTIG	CLEAR TEMPERED INSULATING GLASS			SH	SHOWER		
CTR	CENTER	JAN	JANITOR	SHM	SECURITY HOLLOW METAL		
CU	COPPER	JCT	JUNCTION	SHT	SHEET		
CU	CUBIC	JFB	JOINT FILLER BOARD	SIM	SIMILAR		
CU	COMBINATION UNIT	JST	JOIST	SLNT	SEALANT		
CV	CONDOM VENDOR	JT	JOINT	SM	SHEET METAL		
CY	CUBIC YARD			SND	SANITARY NAPKIN DISPOSAL		
CYL	CYLINDER	KCJ	KEYED CONSTRUCTION JOINT	SNV	SANITARY NAPKIN VENDOR		
		KD	KNOCKDOWN	SPEC	SPECIFICATION(S)		
D	DEPTH	KH	KITCHEN HOOD	SPL	SOUND PRESSURE LEVEL		
DB	DECIBEL	KIT	KITCHEN	SPL	SPECIAL		
DBL	DOUBLE			SQ	SQUARE		
DC	DUST COLLECTOR	L	ANGLE	SS	STAINLESS STEEL		
DEG	DEGREE	LAB	LABORATORY	SS	SOLID SURFACE		
DEMO	DEMOLISH OR DEMOLITION	LAM	LAMINATED	SSA	STORM SHELTER AREA		
DEPR	DEPRESS(ION)(ED)	LAV	LAVATORY	SSS	STAINLESS STEEL SHELF		
DEPT	DEPARTMENT	LB(S)	POUND(S)	ST	STONE		
DET	DETAIL	LBR	LUMBER	ST	STAIR		
DET	DETENTION	LDG	LOADING	STAGD	STAGGERED		
DF	DRINKING FOUNTAIN	LF	LINEAR FOOT	STC	SOUND TRANSMISSION CLASS		
DG	DOOR GRILLE	LG	LENGTH (LONG)	STD	STANDARD		
DIA	DIAMETER	LG	LAMINATED GLASS	STGR	STRINGER		
DIAG	DIAGONAL	LIN	LINEAR	STL	STEEL		
DIM	DIMENSION	LINO	LINOLEUM	STOR	STORAGE		
DIV	SPECIFICATION DIVISION	LKR	LOCKER	STRUCT	STRUCTURAL		
DN	DOWN	LOC	LOCATION	SUBFL	SUBFLOOR		
DPFG	DAMPROOFING	LONG	LONGITUDINAL	SURF	SURFACE		
DR	DOOR	LSC	LIFE SAFETY CODE	SUSP	SUSPENDED		
DSN	DOWNSPOUT NOZZLE	LTG	LIGHTING	SV	SHEET VINYL		
DW	DISHWASHER	LV	LOUVER	SYM	SYMETRICAL		
DWG(S)	DRAWING(S)	LVT	LUXURY VINYL TILE				
DWL(S)	DOWEL(S)	LWC	LIGHT WEIGHT CONCRETE	T	TREAD		
DWR	DRAWER			T&G	TONGUE AND GROOVE		
		M	THOUSAND	T.O.	TOP OF		
E	EAST	MAG	MAGNETIC	TAN	TANGENT		
EA	EACH	MAINT	MAINTENANCE	TB	TOWEL BAR		
EA	EACH FACE	MAN	MANUAL	TBD	TACK BOARD		
EB	EXPANSION BOLT	MAS	MASONRY	TCP	TOILET COMPARTMENT PARTITION		
EC	ELECTRICAL CONTRACTOR	MATL	MATERIAL	TEMP	TERMPORARY		
EE	EACH END	MAX	MAXIMUM	TEMP	TEMPORARY		
EEW	EMERGENCY EYE WASH	MB	MOP BASIN	TERR	TERRAZZO		
EEWS	EMERGENCY EYE WASH SHOWER	MBD	MARKER BOARD	TG	TINTED FLOAT GLASS		
EFF	EFFICIENCY	MBH	MOP/BROOM HOLDER	TH	THRESHOLD		
EJ	EXPANSION JOINT	MC	MEDICINE CABINET	TI	TENANT IMPROVEMENT		
EL	ELEVATION	MECH	MECHANICAL	TIG	TINTED INSULATING GLASS		
ELAS	ELASTOMERIC	MEMB	MEMBRANE	TMR	TILT MIRROR UNIT		
ELEC	ELECTRICAL	MEZZ	MEZZANINE	TOP	TOP OF PAVING		
ELEV	ELEVATOR	MFR	MANUFACTURER	TRANS	TRANSVERSE		
EMER	EMERGENCY	MH	MANHOLE	TT	TERRAZZO TILE		
ENCL	ENCLOSURE	MIN	MINIMUM	TTD	TOILET TISSUE DISPENSER		
ENG	ENGINEER	MISC	MISCELLANEOUS	TTG	TINTED TEMPERED FLOAT GLASS		
ENTR	ENTRANCE	MR/S	MIRROR WITH SHELF	TTIG	TINTED TEMPERED INSULATING GLASS		
EQ	EQUAL	MTD	MOUNTED	TW	TACK WALL		
EQUIP	EQUIPMENT	MTG	MOUNTING	TYP	TYPICAL		
EQUIV	EQUIVALENT	MUL	MULLION				
ERF	EPOXY RESIN FLOORING			UL	UNDERWRITERS LABORATORIES		
EUI	ENERGY USE INTENSITY	N	NORTH	UNEX	UNEXCAVATED		
EW	EACH WAY	NA	NOT APPLICABLE	UNFIN	UNFINISHED		
		NC	NOISE CRITERIA	UNO	UNLESS NOTED OTHERWISE		

GENERAL SYMBOLS



SITE SYMBOLS



DLR Group
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- NOT FOR CONSTRUCTION -

SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT
09-25-19
Revisions

11-16116-20

SYMBOLS AND ABBREVIATIONS

0.1

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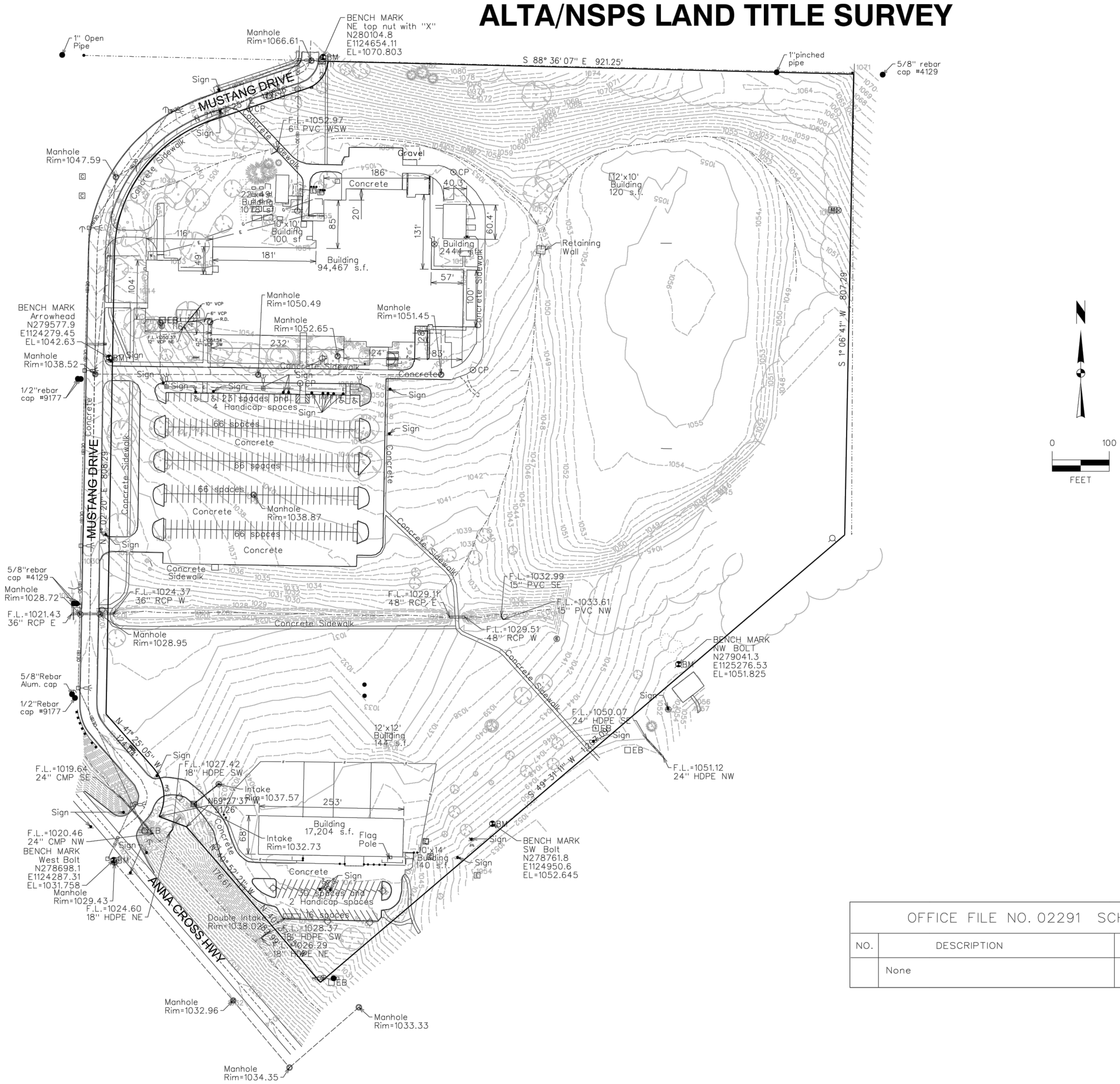
SHENANDOAH HIGH SCHOOL
SHENANDOAH, IOWA

ALTA/NSPS LAND TITLE SURVEY



OFFICE FILE NO. 02291 SCHEDULE B, SECTION 2 EXCEPTIONS				
NO.	DESCRIPTION	BOOK	PAGE	COMMENTS
	None	None	None	None

ALTA/NSPS LAND TITLE SURVEY
SHENANDOAH HIGH SCHOOL
ALTA / NSPS LAND TITLE SURVEY
SHENANDOAH, IOWA

SNYDER & ASSOCIATES, INC.
1800 WEST 22ND ST., SUITE 200
ATLANTIC, IOWA 50022
712-243-6505 | www.snyder-associates.com

SNYDER & ASSOCIATES

MARK	REVISION	DATE	BY

Engineer: MLJ Checked By: MLJ Scale: 1"= 60'
Technician: TLG Date: 06/06/19 Field Bk: Pg:
Project No: 1190527 Sheet 2 of 2

Project No: 1190527
Sheet 2 of 2

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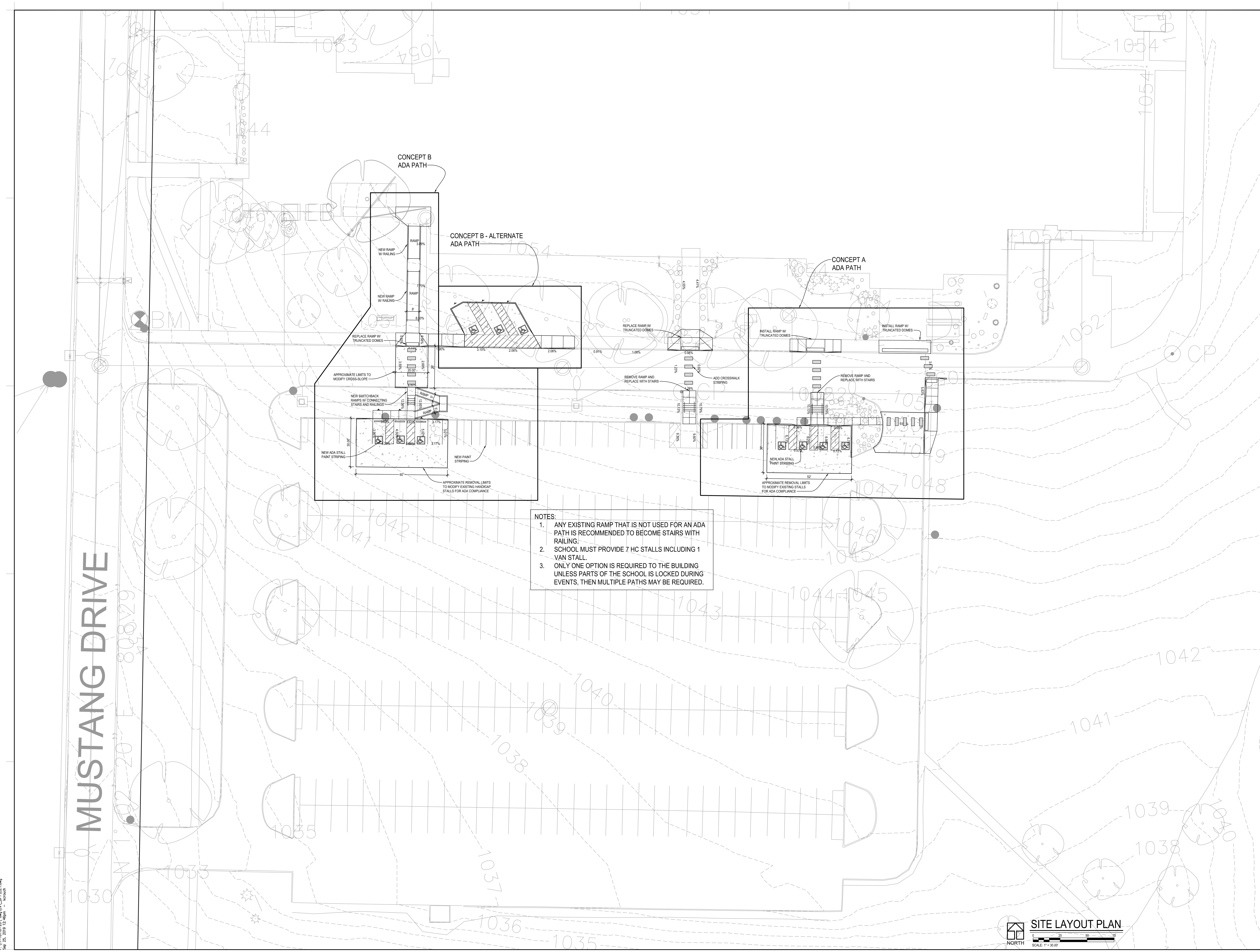
SHENANDOAH HIGH SCHOOL RENOVATIONS
SHENANDOAH COMMUNITY SCHOOL DISTRICT
1000 Mustang Drive
Shenandoah, IA 51601

DESIGN DEVELOPMENT
09-25-19

11-16116-20
SITE SURVEY

NORTH
SITE TOPOGRAPHIC SURVEY
0 25 50 75
SCALE: 1" = 30.00'

C0.1



NOTES:

1. ANY EXISTING RAMP THAT IS NOT USED FOR AN ADA PATH IS RECOMMENDED TO BECOME STAIRS WITH RAILING.
2. SCHOOL MUST PROVIDE 7 HC STALLS INCLUDING 1 VAN STALL.
3. ONLY ONE OPTION IS REQUIRED TO THE BUILDING UNLESS PARTS OF THE SCHOOL IS LOCKED DURING EVENTS, THEN MULTIPLE PATHS MAY BE REQUIRED.

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SHENANDOAH HIGH SCHOOL RENOVATIONS
SHENANDOAH COMMUNITY SCHOOL DISTRICT

1000 Mustang Drive
Shenandoah, IA 51601

DESIGN DEVELOPMENT

09-25-19

11-16116-20
SITE LAYOUT PLAN

C2.1

GENERAL PROJECT INFORMATION:

NAME OF PROJECT:	SHENANDOAH COMMUNITY SCHOOL DISTRICT, HIGH SCHOOL RENOVATIONS
LOCATION:	1000 MUSTANG DR, SHENANDOAH, IA 51601
PROPOSED USE:	E
OWNER:	SHENANDOAH PUBLIC SCHOOL DISTRICT 304 WEST NISHNA ROAD SHENANDOAH, IA 51601 712-246-1581
ARCHITECT:	DLR GROUP MIKE KROS, LICENSE NUMBER 6457 FRANCES ST STE 200 OMAHA, NE 68106 402-393-4100

APPLICABLE BUILDING CODES:

CITY OF SHENANDOAH, IA:
2015 INTERNATIONAL BUILDING CODE (IBC)
2015 INTERNATIONAL FIRE CODE (IFC)
2015 INTERNATIONAL MECHANICAL CODE (IMC)
2017 NATIONAL ELECTRICAL CODE (NEC)
2015 UNIFORM PLUMBING CODE (UPC) & IOWA ADMINISTRATIVE CODE 641-25
2012 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
2015 INTERNATIONAL EXISTING BUILDING CODE

STATE OF IOWA:

IOWA STATE BUILDING CODE, IAC 661-CHAPTER 301 (2016)

(APPLICABLE ONLY FOR STATE OWNED CONSTRUCTION, PROJECTS FUNDED WITH STATE FUNDS AND WHERE LOCAL JURISDICTIONS HAVE FORMALLY ADOPTED.)

STATE OF IOWA ACCESSIBILITY RULES AND REGULATIONS, IAC IAC-CHAPTER 302 (2016)

STATE OF IOWA FIRE SAFETY RULES, IAC 661-CHAPTER 200 (2016)

STATE OF IOWA BUILDING CODE THERMAL AND LIGHTING EFFICIENCY STANDARDS - IAC 661 CHAPTER 303 (2014)

STATE OF IOWA MINIMUM TOILET FACILITY STANDARD, IAC 641-CHAPTER 25 (2017)

ENFORCED BY THE OFFICE OF STATE FIRE MARSHAL AND DEPARTMENT OF PUBLIC HEALTH.

AMERICANS WITH DISABILITIES ACT (ADA)

ADA IS APPLICABLE TO THIS BUILDING UNDER TITLE II AS A PUBLIC ENTITY. TITLE II OF THE ADA SPECIFICALLY REFERS TO ANY STATE OR LOCAL GOVERNMENT SERVICES. THEREFORE, A SCHOOL IS CONSIDERED A PUBLIC ENTITY.

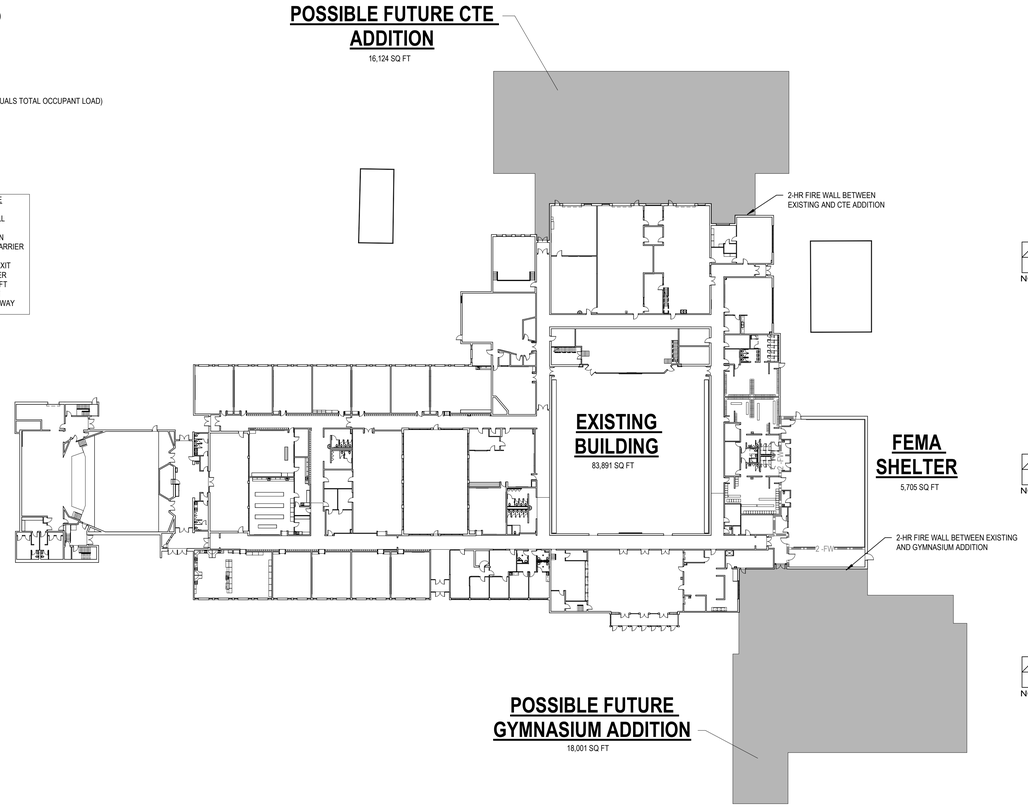
AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES - 2010 (ADA)

SYMBOL LEGEND

- OCCUPANCY LOAD
- ACCESSORY USE AREA (OCCUPANCY LOAD IS NOT INCLUDED IN LOADS BEYOND THIS ROOM)
- 0 / 0 - COMBINED OCCUPANT LOAD AT A GIVEN DOOR OR STAIR; TOTAL EXIT CAPACITY OF DOOR OR STAIR (THE CAPACITY OF DOORS ARE DETERMINED AS FOLLOWS: CLEAR OPENING WIDHT IN INCHES DIVIDED BY 0.2 THE CAPACITY OF STAIRS ARE DETERMINED AS FOLLOWS WIDTH IN INCHES DIVIDED BY 0.3)
- 0 / 0 - COMBINED OCCUPANT LOAD AT A GIVEN DOOR. (SUM OF THESE EQUALS TOTAL OCCUPANT LOAD); TOTAL EXIT CAPACITY OF DOOR (THE CAPACITY OF DOORS ARE DETERMINED AS FOLLOWS: CLEAR OPENING WIDTH IN INCHES DIVIDED BY 0.2)
- PD - PANIC DEVICE
- XX MIN - DOOR FIRE RATING

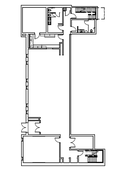
WALL SEPARATION LEGEND

WALL HOURLY RATING		WALL FIRE RATING TYPE	
0 = 0 HOUR		C = CORRIDOR	
1/2 = 1/2 HOUR		EW = EXTERIOR WALL	
1 = 1 HOUR		FB = FIRE BARRIER	
2 = 2 HOUR		FP = FIRE PARTITION	
		FSB = FIRE/SMOKE BARRIER	
SP = SMOKE PARTITION		FW = FIRE WALL	
SW = SMOKE WALL		HX = HORIZONTAL EXIT	
		SB = SMOKE BARRIER	
		VS = VERTICAL SHAFT	
		VX = VERTICAL EXIT	
		XP = EXIT PASSAGEWAY	



FLOOR PLAN - OCCUPANCY TYPE/ FRONTAGE DIAGRAM

NORTH SCALE: 1" = 40'-0"

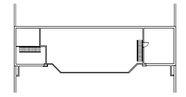


EXISTING BASEMENT PLAN

NORTH SCALE: 1" = 40'-0"

EXISTING MECHANICAL MEZZANINE

NORTH SCALE: 1" = 40'-0"



EXISTING WEIGHT ROOM STORAGE

NORTH SCALE: 1" = 40'-0"

EXISTING STORAGE ROOM

NORTH SCALE: 1" = 40'-0"

BUILDING HEIGHT, NUMBER OF STORIES AND BUILDING AREA LIMITATIONS PER IBC CHAPTER 5

SPRINKLER REQUIRED PER IBC 903 SINCE BUILDING AREA IS LARGER THAN 12,000 SF

BUILDING ADDITION 1 - CTE: SINGLE-OCCUPANCY, ONE STORY BUILDING	
OCCUPANCY TYPE	E
PROPOSED TYPE OF CONSTRUCTION	II-B
ALLOWABLE BUILDING HEIGHT ABOVE GRADE PLANE - PER IBC TABLE 504.3	
S - AUTOMATIC SPRINKLER SYSTEM	75
PROPOSED MAXIMUM HEIGHT (FEET)	**27**
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE - PER IBC TABLE 504.4	
S - AUTOMATIC SPRINKLER SYSTEM	3
PROPOSED NUMBER OF STORIES ABOVE GRADE PLANE	**1**
ALLOWABLE AREA CALCULATION PER IBC SECTION 506.2.1 EQUATION 5-1 Aa = At + (NS x If)	
ALLOWABLE AREA FACTOR (At) TABLE 506.2 S1 IN SQUARE FEET	58,000
NS - NON SPRINKLERED	14,500
S1 - AUTOMATIC SPRINKLER SYSTEM - 1 STORY ABOVE GRADE	58,000
IBC 506.3 - FRONTAGE INCREASE (If) [NOT USED]	0.00
ALLOWABLE BUILDING AREA (Aa) IN SQUARE FEET	58,000
PROPOSED BUILDING AREA (SQUARE FEET)	**16,124**

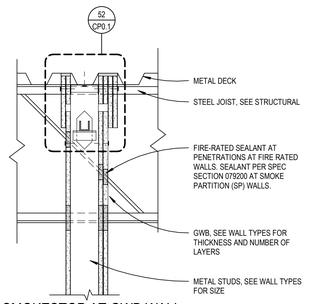
BUILDING HEIGHT, NUMBER OF STORIES AND BUILDING AREA LIMITATIONS PER IBC CHAPTER 5

SPRINKLER REQUIRED PER IBC 903 SINCE BUILDING AREA IS LARGER THAN 12,000 SF

BUILDING ADDITION 2- GYMNASIUM: SINGLE-OCCUPANCY, ONE STORY BUILDING	
OCCUPANCY TYPE	A-4
PROPOSED TYPE OF CONSTRUCTION	II-B
ALLOWABLE BUILDING HEIGHT ABOVE GRADE PLANE - PER IBC TABLE 504.3	
S - AUTOMATIC SPRINKLER SYSTEM	75
PROPOSED MAXIMUM HEIGHT (FEET)	**33'-3"**
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE - PER IBC TABLE 504.4	
S - AUTOMATIC SPRINKLER SYSTEM	3
PROPOSED NUMBER OF STORIES ABOVE GRADE PLANE	**1**
ALLOWABLE AREA CALCULATION PER IBC SECTION 506.2.1 EQUATION 5-1 Aa = At + (NS x If)	
ALLOWABLE AREA FACTOR (At) TABLE 506.2 S1 IN SQUARE FEET	38,000
NS - NON SPRINKLERED	9,500
S1 - AUTOMATIC SPRINKLER SYSTEM - 1 STORY ABOVE GRADE	38,000
IBC 506.3 - FRONTAGE INCREASE (If) [NOT USED]	0.00
ALLOWABLE BUILDING AREA (Aa) IN SQUARE FEET	38,000
PROPOSED BUILDING AREA (SQUARE FEET)	**18,001**

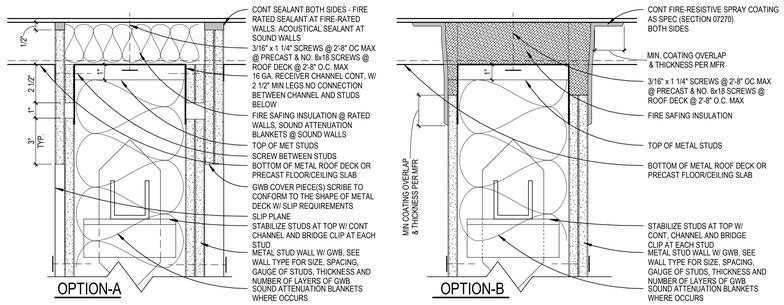
OCCUPANCY GROUPS INCLUDED IN PROJECT

OCCUPANCY GROUPS:	IBC	NFPA 101 (LSC)
ASSEMBLY FOR VIEWING PERFORMING ARTS OR MOTION PICTURES, USUALLY WITH FIXED SEATS.	ASSEMBLY GROUP A-1	NEW OR EXISTING ASSEMBLY OCCUPANCY
ASSEMBLY FOR VIEWING INDOOR SPORTING EVENTS AND ACTIVITIES WITH SPECTATOR SEATING.	ASSEMBLY GROUP A-4	NEW OR EXISTING ASSEMBLY OCCUPANCY
EDUCATIONAL THRU 12TH GRADE FOR USE BY	EDUCATIONAL GROUP E	NEW OR EXISTING



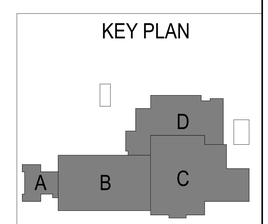
51 / CP0.1 FIRE/ SMOKESTOP AT GWB WALL

SCALE: 1 1/2" = 1'-0"



52 / CP0.1 STUD WALL SLIP CONNECTION DETAILS

SCALE: 3" = 1'-0"



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SHENANDOAH HIGH SCHOOL RENOVATIONS
SHENANDOAH COMMUNITY SCHOOL DISTRICT

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CODE SUMMARY AND NOTES

CP0.1

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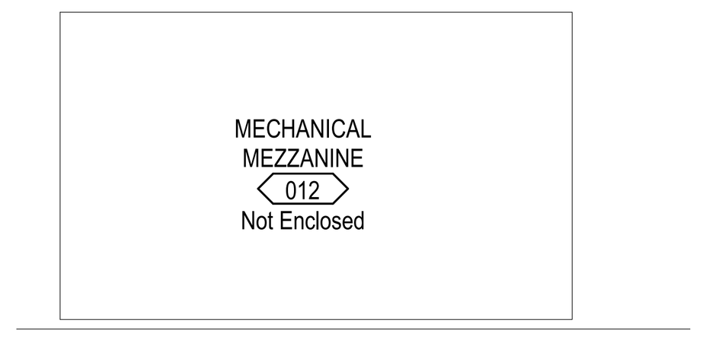
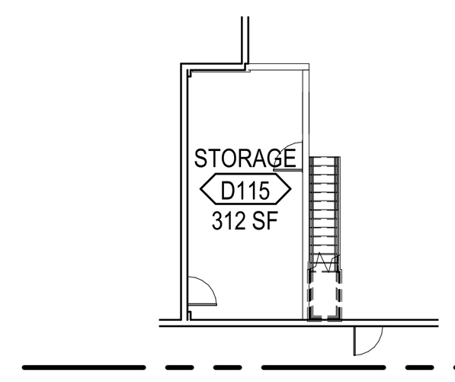


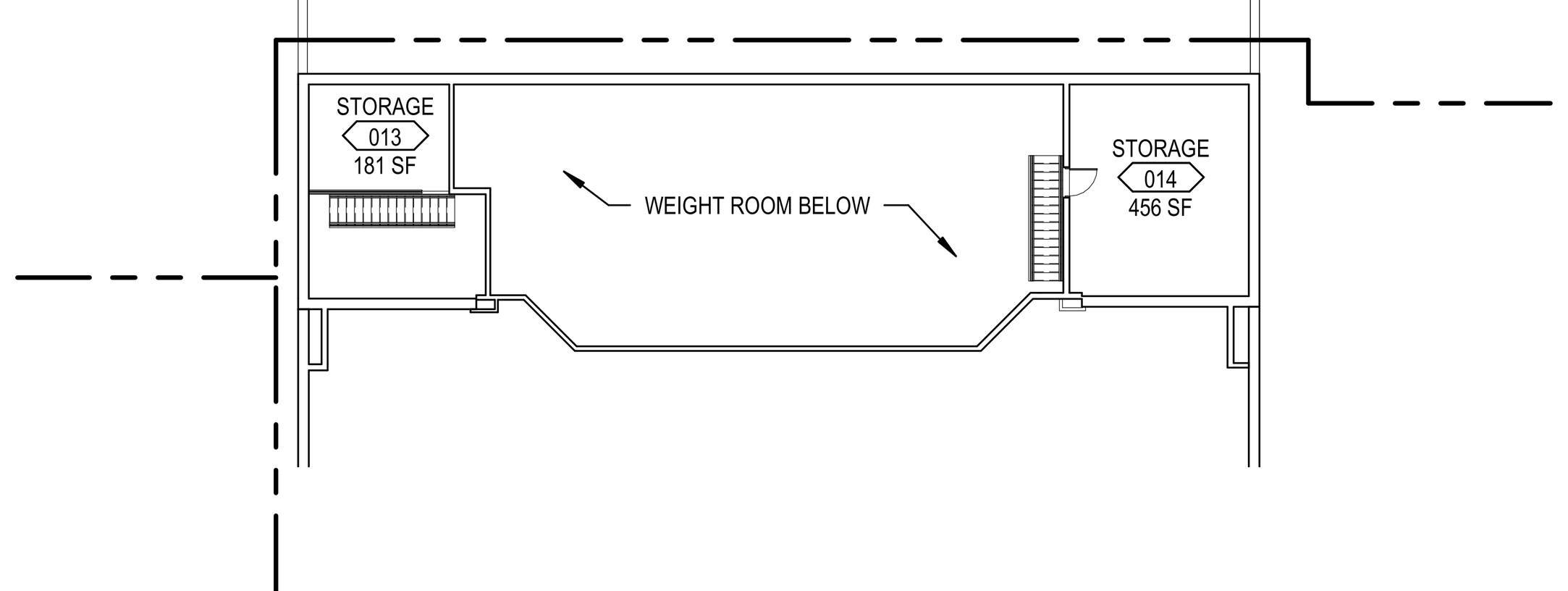


CODE PLAN, SHOP MECHANICAL MEZZANINE

NORTH
SCALE: 1" = 20'-0"

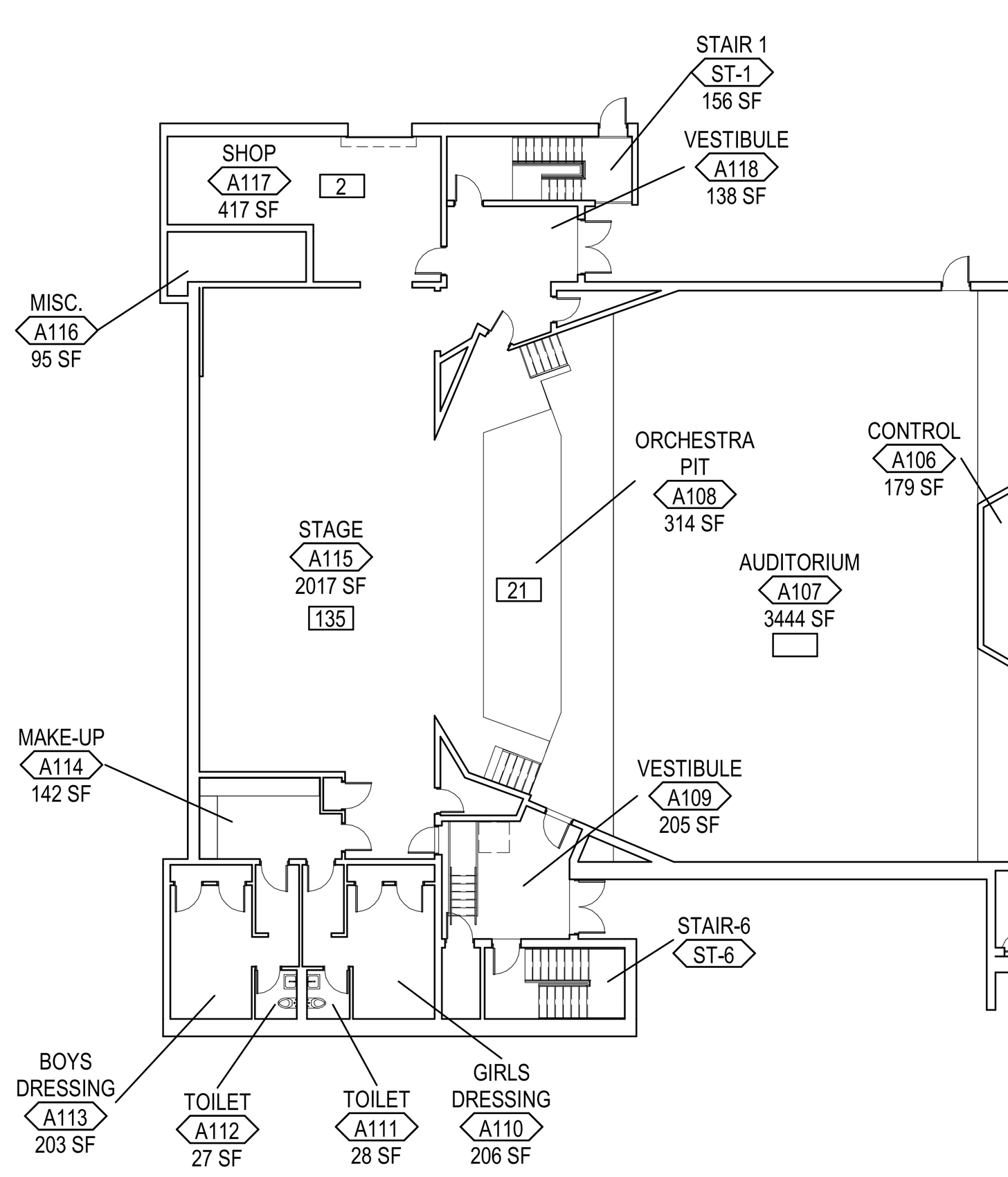
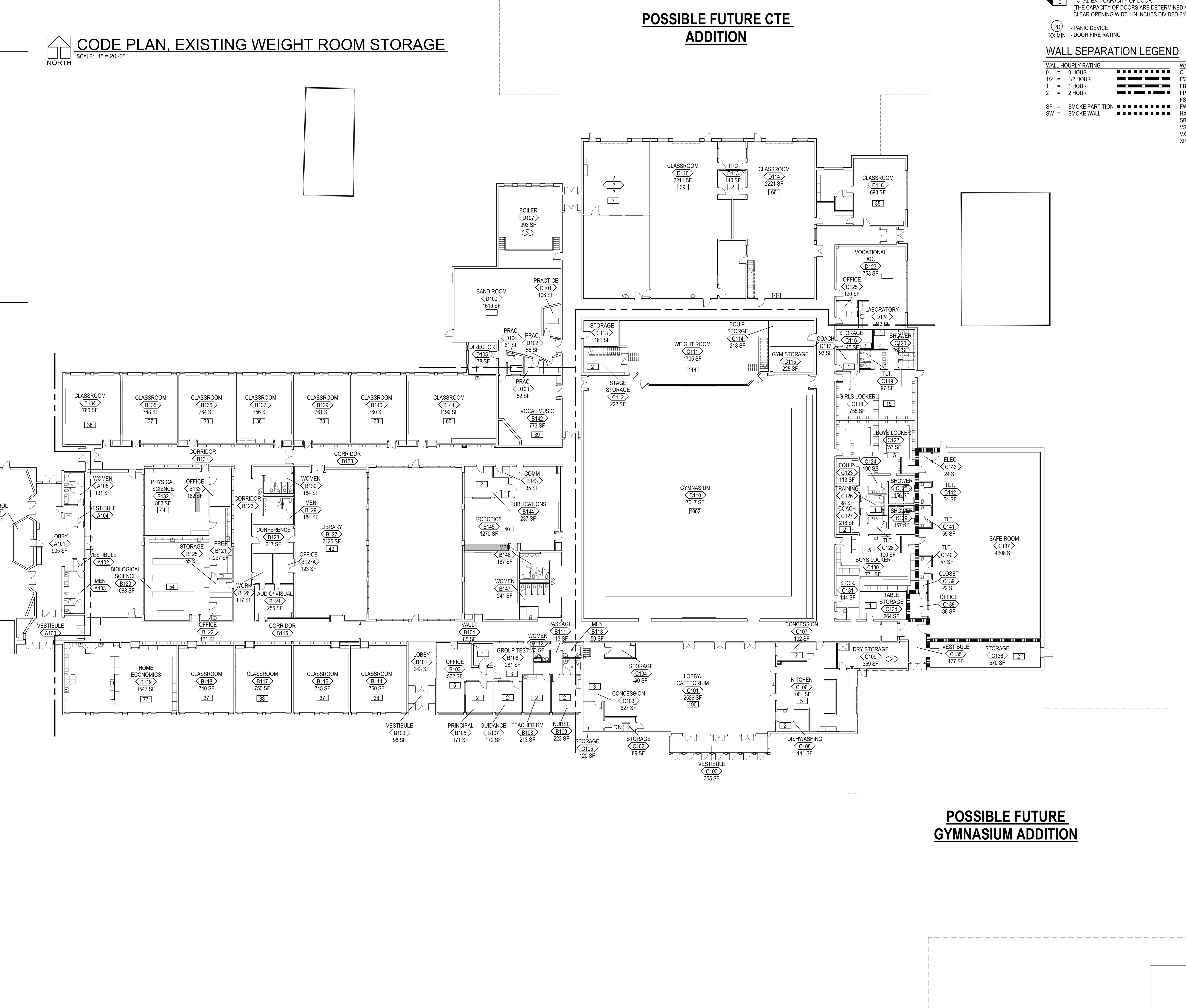
CODE PLAN, EXISTING WEIGHT ROOM STORAGE

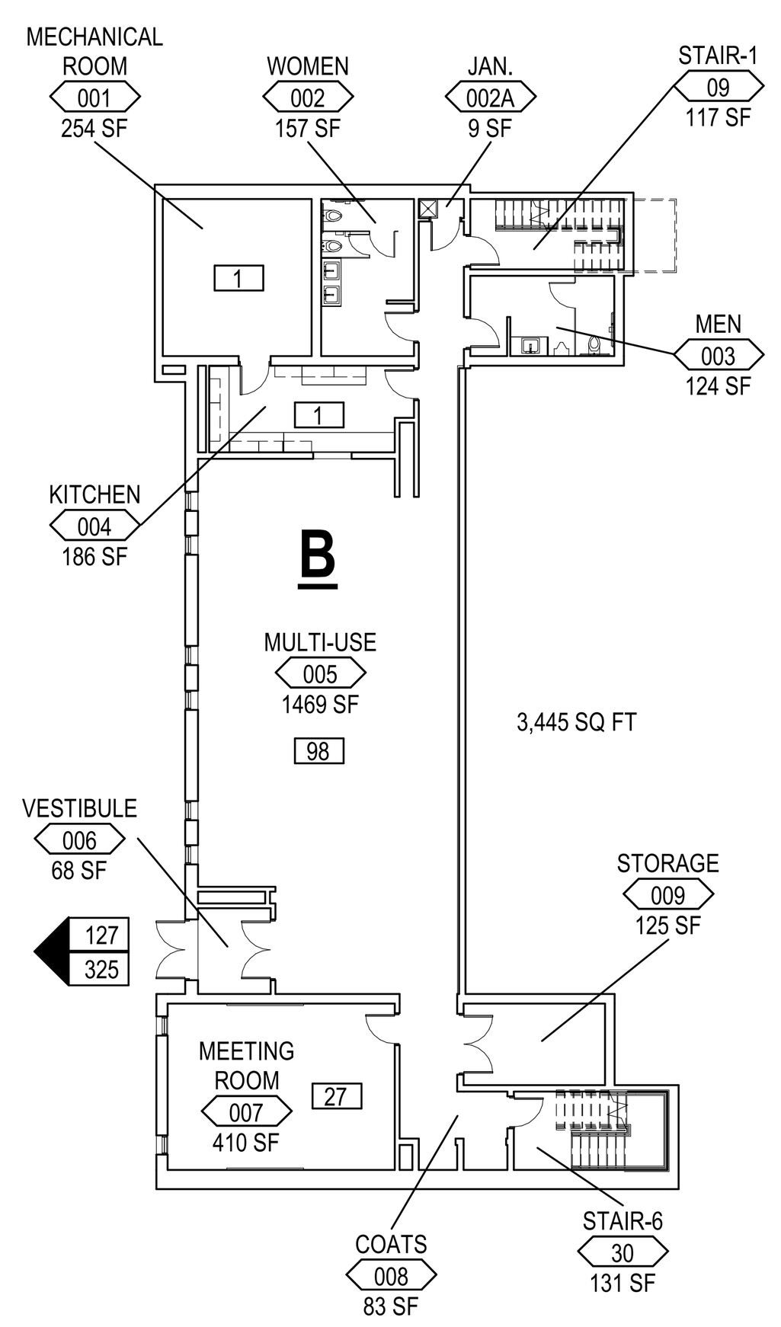
NORTH
SCALE: 1" = 20'-0"



CODE PLAN, EXISTING STORAGE ROOMS

NORTH
SCALE: 1" = 20'-0"



BASEMENT LEVEL

NORTH
SCALE: 1" = 20'-0"

CODE PLAN, LEVEL 1

NORTH
SCALE: 1" = 20'-0"

SYMBOL LEGEND

- #### - OCCUPANCY LOAD
- ### - ACCESSORY USE AREA (OCCUPANCY LOAD IS NOT INCLUDED IN LOADS BEYOND THIS ROOM)
- 0 / 0 - COMBINED OCCUPANT LOAD AT A GIVEN DOOR OR STAIR - TOTAL EXIT CAPACITY OF DOOR OR STAIR (THE CAPACITY OF DOORS ARE DETERMINED AS FOLLOWS: CLEAR OPENING WIDHT IN INCHES DIVIDED BY 0.2 THE CAPACITY OF STAIRS ARE DETERMINED AS FOLLOWS WIDTH IN INCHES DIVIDED BY 0.3)
- 0 / 0 - COMBINED OCCUPANT LOAD AT A GIVEN DOOR. (SUM OF THESE EQUALS TOTAL OCCUPANT LOAD) - TOTAL EXIT CAPACITY OF DOOR (THE CAPACITY OF DOORS ARE DETERMINED AS FOLLOWS: CLEAR OPENING WIDTH IN INCHES DIVIDED BY 0.2)
- (PD) - PANIC DEVICE
- XX MIN - DOOR FIRE RATING

WALL SEPARATION LEGEND

WALL HOURLY RATING		WALL FIRE RATING TYPE
0 = 0 HOUR		C = CORRIDOR
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2 = 2 HOUR		FP = FIRE PARTITION
		FSB = FIRE/SMOKE BARRIER
SP = SMOKE PARTITION		FW = FIRE WALL
SW = SMOKE WALL		HX = HORIZONTAL EXIT
		SB = SMOKE BARRIER
		VS = VERTICAL SHAFT
		VX = VERTICAL EXIT
		XP = EXIT PASSAGEWAY

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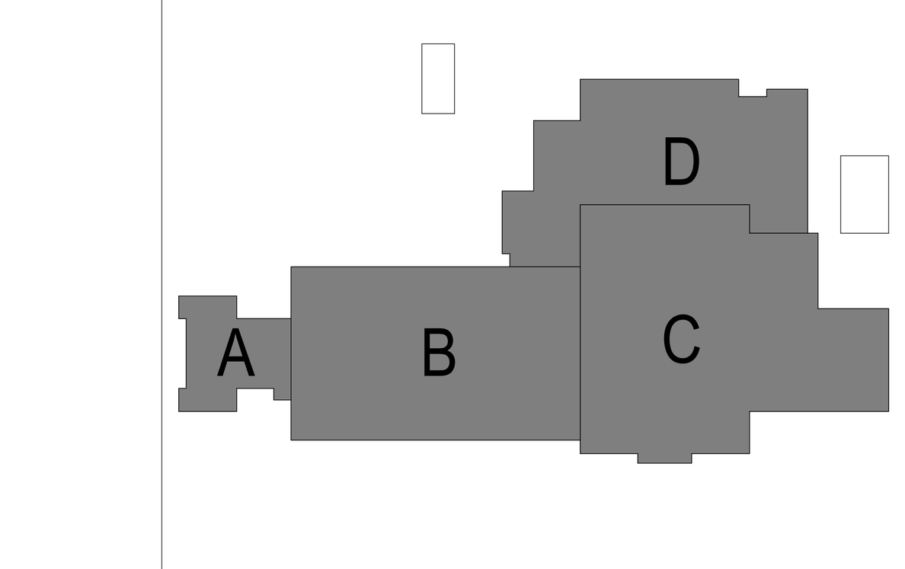
SHENANDOAH HIGH SCHOOL RENOVATIONS
SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT
09-25-19
Revisions

KEY PLAN



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CODE PLAN

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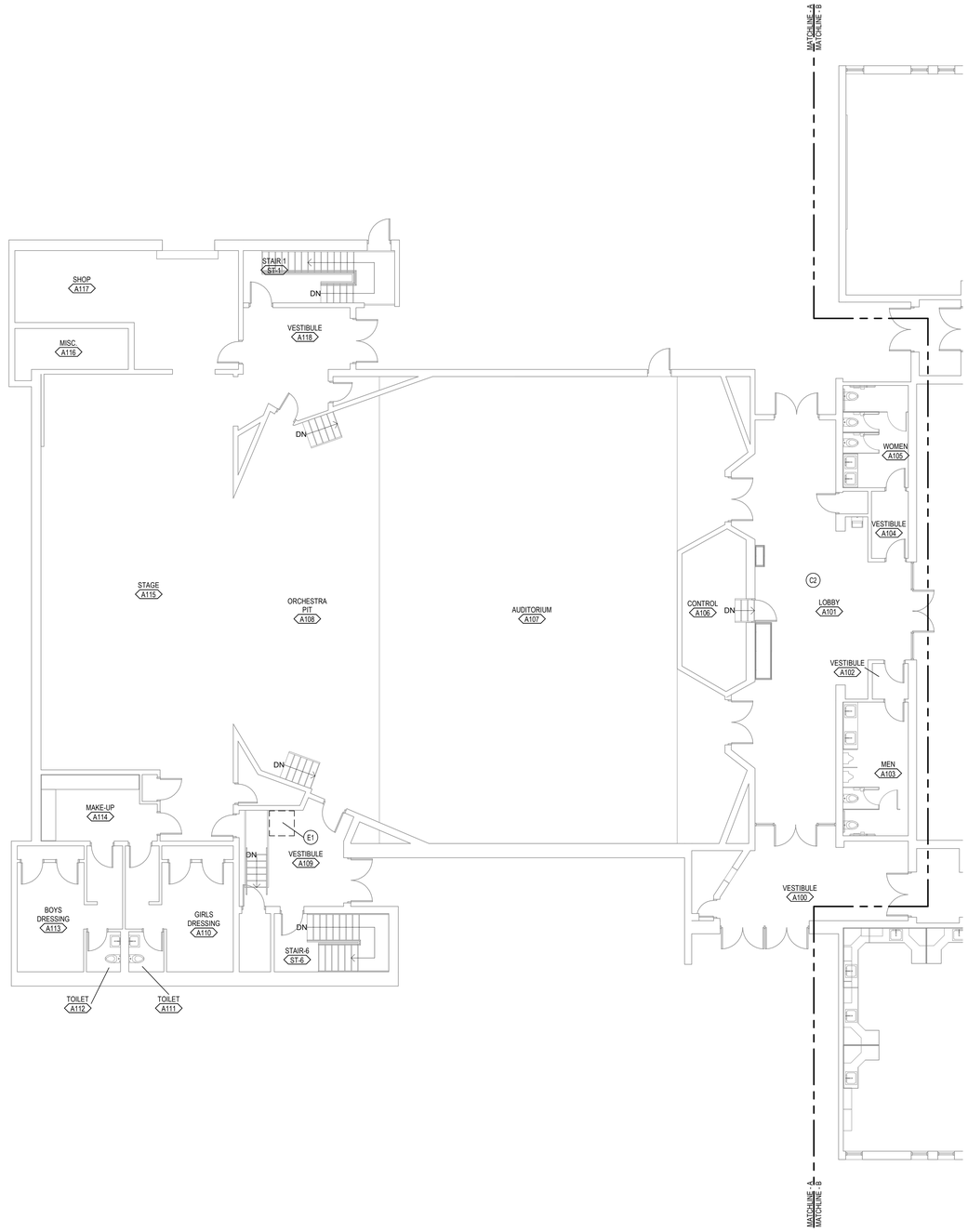


DEMOLITION PLAN - AREA A

NORTH

SCALE: 1/8" = 1'-0"

DEMOLITION GENERAL NOTES

DEMOLITION NOTES APPLY TO ALL DEMOLITION SHEETS.

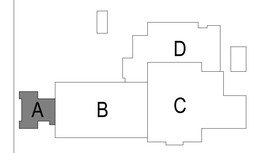
THE CONTRACTOR SHALL:

A. COORDINATE ALL DEMOLITION/PHASING EFFORTS WITH THE ARCHITECT-ENGINEER AND OWNER'S REPRESENTATIVES. EVERY EFFORT SHALL BE MADE TO MINIMIZE DISRUPTION OF OWNER'S OPERATIONS AND TO PROVIDE BUILDING USER'S SAFETY. EXCESSIVE NOISE OR VIBRATION SHALL BE PRE-APPROVED AND COORDINATED WITH THE OWNER'S REPRESENTATIVE.
B. COORDINATE ANY DISRUPTION OF UTILITY SERVICES WITH THE OWNER AND AS SPECIFIED.
C. CONSTRUCT TEMPORARY CONSTRUCTION PARTITIONS WITHIN THE EXISTING BUILDING WHICH OFFER A ONE-HOUR ENCLOSURE TO ISOLATE ANY DEMOLITION/CONSTRUCTION WORK FROM THE GENERAL PUBLIC AND AS DEEMED NECESSARY BY THE OWNER AND CODE OFFICIAL HAVING JURISDICTION. COORDINATE LOCATIONS WITH THE OWNER AND MAINTAIN MEANS OF EGRESS THROUGHOUT THE WORK.
D. MAINTAIN A SECURE, WEATHER-TIGHT ENCLOSURE AT ALL TIMES.
E. VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS AND NOTIFY THE ARCHITECT-ENGINEER OF ANY DISCREPANCIES.
F. REMOVE IN THEIR ENTIRETY ALL EXISTING WALLS, DOORS, MILLWORK, PLUMBING FIXTURES, CEILINGS, SOFFITS, MARKERBOARDS, ETC. AS REQUIRED TO EXECUTE THE DEMOLITION/CONSTRUCTION WORK DESCRIBED BY THE DRAWINGS.
G. THE OWNER SHALL RESERVE THE RIGHT TO SALVAGE ANY MATERIALS.
H. PROVIDE PROTECTION FOR ALL EXISTING BUILDING MATERIALS AND EQUIPMENT FROM DAMAGE DUE TO ANY DEMOLITION OR CONSTRUCTION-RELATED INCIDENT PERFORMED UNDER THIS CONTRACT.
I. REPAIR OR REPLACE ITEMS THAT ARE DAMAGED AS A RESULT OF DEMOLITION OR CONSTRUCTION TO MATCH EXISTING FINISH AND/OR CONDITION.
J. EXISTING MATERIALS SHALL NOT BE REUSED UNLESS NOTED OTHERWISE OR AS AUTHORIZED BY ARCHITECT-ENGINEER.
K. VERIFY AND MAINTAIN THE LOCATION OF EXISTING POWER, COMMUNICATION AND DATA CABLES TO PREVENT INTERRUPTION OF THEIR SERVICE.
L. PATCH FLOOR, WALL AND CEILING PENETRATIONS RESULTING FROM REMOVAL OR RE-ROUTING OF NEW OR EXISTING PIPING, DUCTWORK, CONDUIT, ETC. AS REQUIRED TO MAINTAIN FIRE SEPARATIONS. FINISH AS REQUIRED FOR NEW OR EXISTING ADJACENT SURFACES.
M. CAP ALL DISCONNECTED MECHANICAL PIPING LINES WITHIN THE WALL OR FLOOR. PATCH AND FINISH AS REQUIRED TO MATCH NEW OR EXISTING ADJACENT SURFACES.
N. SEE MECHANICAL AND ELECTRICAL DRAWINGS AND NOTES FOR FURTHER SEQUENCING AND SCOPE OF WORK.
O. AVOID ANY DISTURBANCE OF SOILS WITHIN THE ZONE OF INFLUENCE AROUND EXISTING FOOTINGS AND FLOOR SLABS AS DIRECTED BY GEOTECHNICAL ENGINEER.
P. WHERE CMU WALLS ARE INDICATED TO BE REMOVED, PREPARE ADJACENT WALLS TO RECEIVE NEW PATCH/FINISH BY REMOVING CMU IN TOOTH-IN PATTERN BOTH SIDES OF DEMOLITION FOR CONTRACTOR TO TOOTH-IN NEW CMU PATCHES.
Q. WHERE PLASTER/STUD WALLS ARE INDICATED TO BE REMOVED, PREPARE ADJACENT WALLS TO RECEIVE NEW PATCH/FINISH BY SAWCUTTING ADJACENT PLASTER FINISH A MINIMUM OF 1'-0" BEYOND DEMOLITION.

DEMOLITION KEYED NOTES

C2	REMOVE EXISTING CEILING IN ITS ENTIRETY.
E1	REMOVE EXISTING WHEEL CHAIR LIFT IN ITS ENTIRETY.

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

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DEMOLITION PLAN - AREA A

AD1.1A

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GENERAL SHEET NOTES:

1. SEE SHEET AD1.1A FOR GENERAL DEMOLITION NOTES.

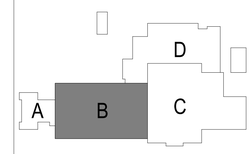
DEMOLITION KEYED NOTES	
C1	REMOVE EXISTING CEILING TILES IN THEIR ENTIRETY. EXISTING CEILING GRID TO REMAIN, REPLACE GRID AS NEEDED.
C2	REMOVE EXISTING CEILING IN ITS ENTIRETY.
D1	REMOVE EXISTING DOOR(S) AND FRAME IN ITS ENTIRETY.
D2	REMOVE EXISTING DOOR FRAME IN ITS ENTIRETY.
F1	REMOVE EXISTING FLOOR FINISH AND BASE IN ITS ENTIRETY, PREPARE FLOOR FOR NEW FINISHES.
P1	REMOVE EXISTING PLUMBING FIXTURE AND TOILET ACCESSORIES IN THEIR ENTIRETY. SEE PLUMBING FOR ADDITIONAL DEMOLITION.
W1	REMOVE EXISTING CMU WALL IN ITS ENTIRETY.
W2	SAWCUT AND REMOVE PORTION OF WALL AS SHOWN.

DEMOLITION PLAN - AREA B

SCALE: 1/8" = 1'-0"

NORTH

KEY PLAN



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11-16116-20

DEMOLITION PLAN - AREA B

AD1.1B

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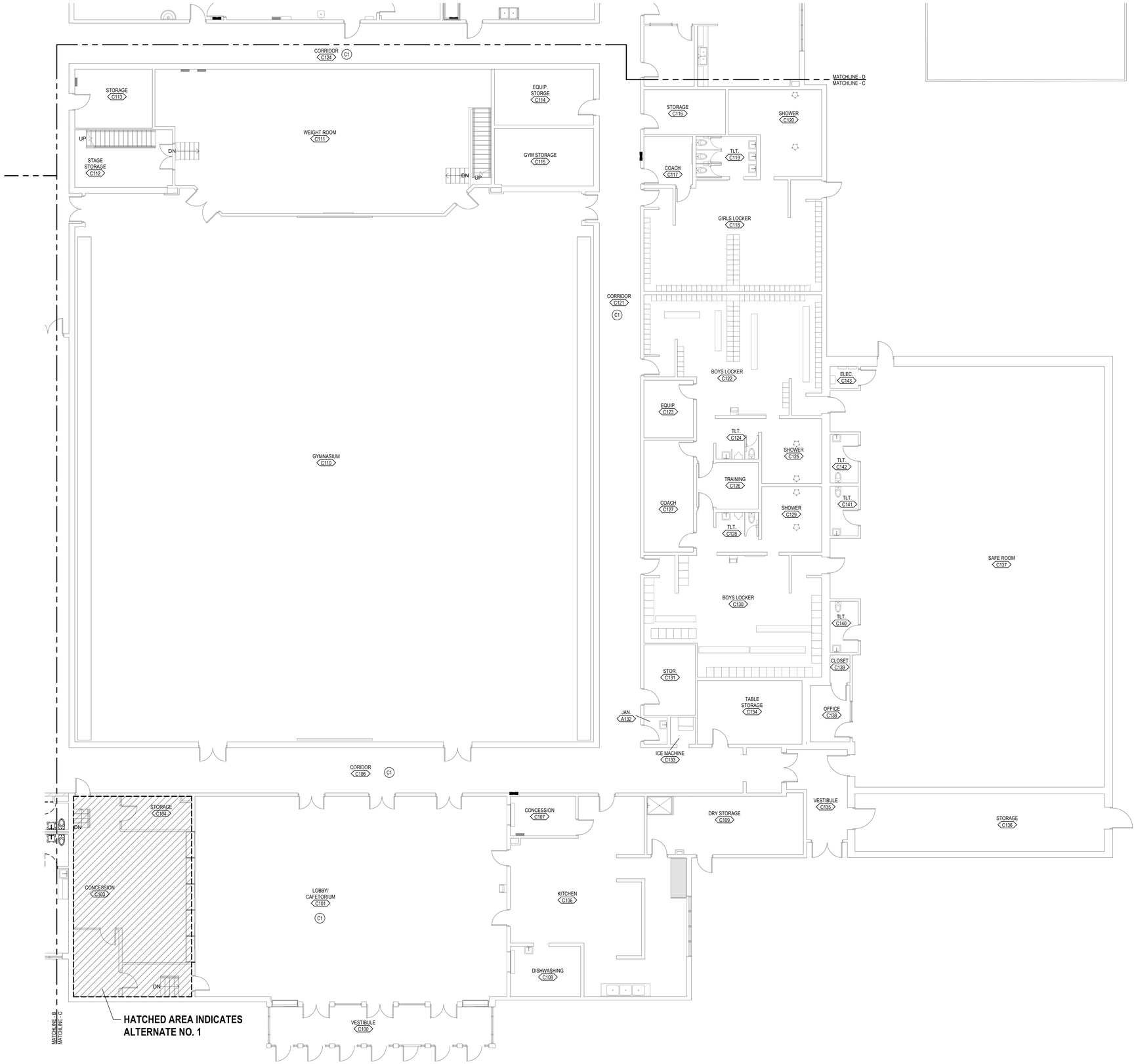
GENERAL SHEET NOTES:

1. SEE SHEET AD1.1A FOR GENERAL DEMOLITION NOTES.

DEMOLITION KEYED NOTES	
C1	REMOVE EXISTING CEILING TILES IN THEIR ENTIRETY. EXISTING CEILING GRID TO REMAIN, REPLACE GRID AS NEEDED.

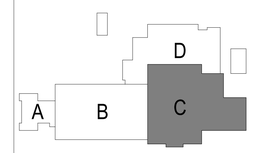


DEMOLITION PLAN - AREA C

NORTH

SCALE: 1/8" = 1'-0"

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

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DEMOLITION PLAN - AREA C

AD1.1C

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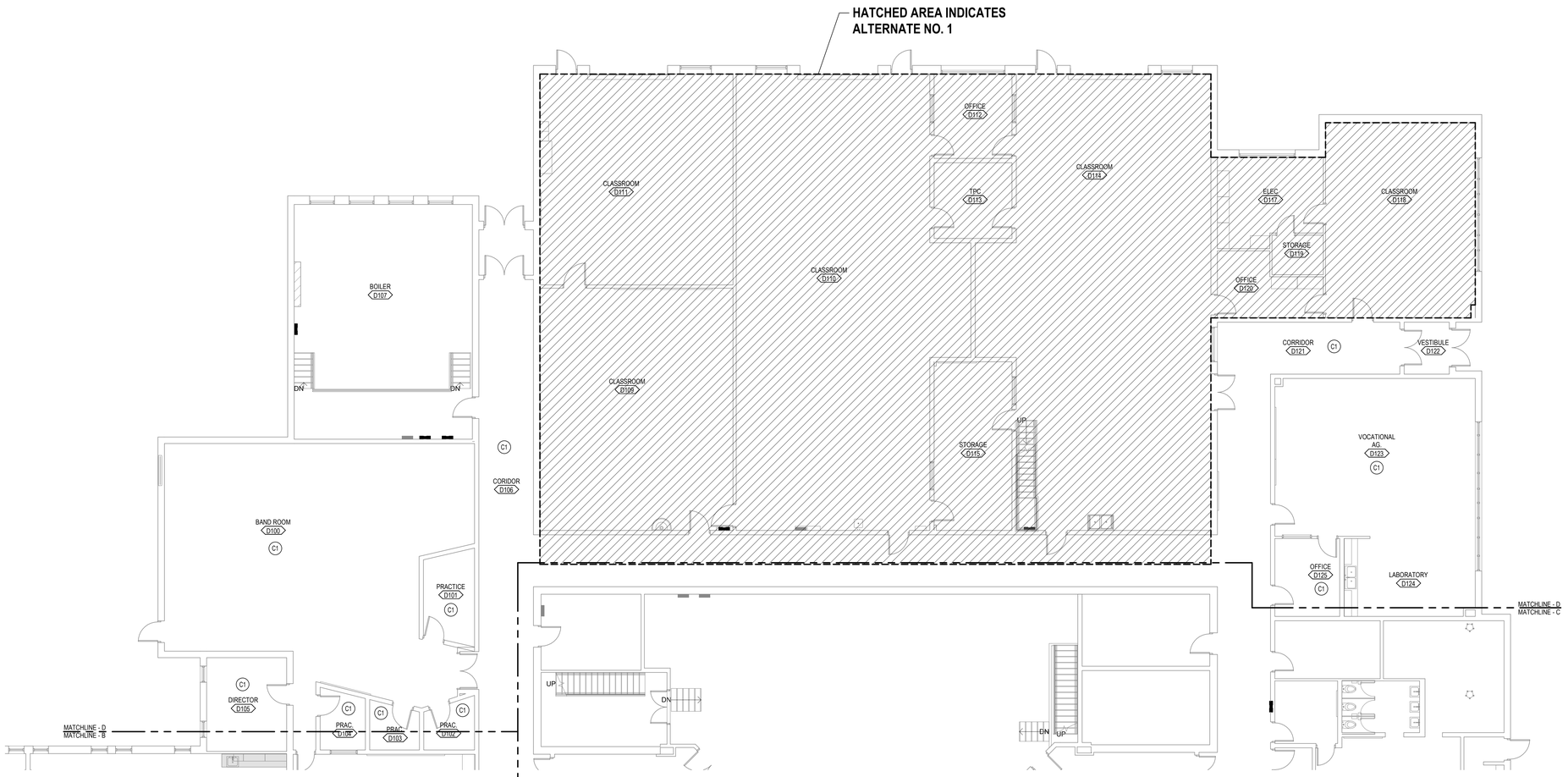
GENERAL SHEET NOTES:

1. SEE SHEET AD1.1A FOR GENERAL DEMOLITION NOTES.

DEMOLITION KEYED NOTES	
C1	REMOVE EXISTING CEILING TILES IN THEIR ENTIRETY. EXISTING CEILING GRID TO REMAIN. REPLACE GRID AS NEEDED.

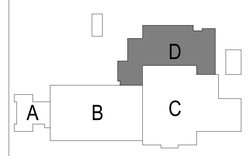


DEMOLITION PLAN - AREA D

SCALE: 1/8" = 1'-0"

NORTH

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

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09-25-19
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DEMOLITION PLAN - AREA D

AD1.1D

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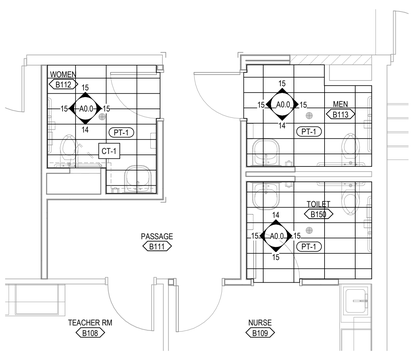
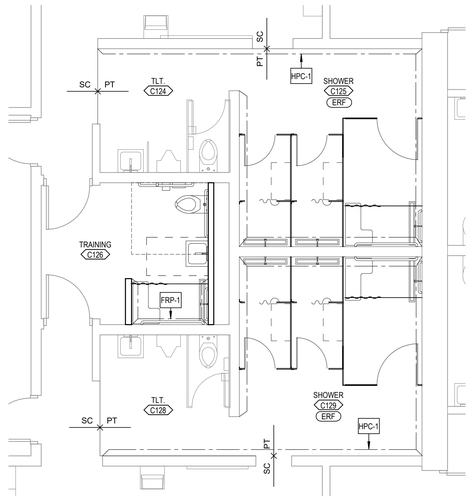
INTERIOR MATERIALS SCHEDULE

OPS 60th & L Street New HS

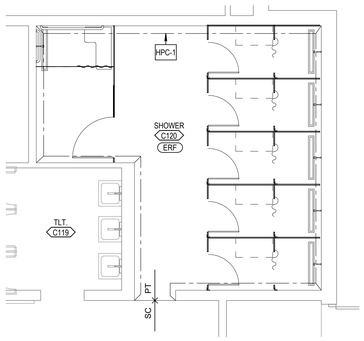
SPEC #	DESIGNATION	PRODUCT	BASIS OF DESIGN MANUF	STYLE/PRODUCT	COLOR/FINISH	SIZE	COMMENTS/LOCATION
PLASTIC PANELING							
066400	FRP-1	GLASS-FIBER-REINFORCED PLASTIC PANELING	MARLITE	SYMMETRIX FRP	C 100-G44 WHITE	4' x 8' x 3/32"	TRAINING SHOWER
TILING, GROUT & METAL TRIM ACCESSORIES							
093013	PT-1	PORCELAIN TILE	FLORIM USA	FAROE	MIST	12" x 24"	RESTROOM FLOORS
	CT-1	CERAMIC TILE	TBD	TBD	TBD	TBD	RESTROOM WET WALLS
	CT-2	CERAMIC TILE	TBD	TBD	TBD	TBD	RESTROOM NON-WET WALLS
	ERF	EPOXY QUARTZ RESINOUS FLOORING	TNEMEC	224 DECO-FLECK	507	N/A	LOCKER ROOM SHOWER FLOORS
	MTA-1	METAL TRIM ACCESSORY	SCHLUTER	DILEX - EHK	STAINLESS STEEL	VIF	FLOOR TILE TO WALL TILE
	MTA-2	METAL TRIM ACCESSORY	SCHLUTER	RENO-T	STAINLESS STEEL	VIF	TILE TO SAME HEIGHT SURFACE
	MTA-3	METAL TRIM ACCESSORY	SCHLUTER	RENO-U	STAINLESS STEEL	VIF	TILE TO CONCRETE
ACOUSTICAL PANEL CEILINGS							
095113	APC-1	ACOUSTICAL PANEL CEILING	ARMSTRONG	OPTIMA	WHITE	24in x 24in	TYPICAL CORRIDOR AND CLASSROOMS
RESILIENT BASE AND ACCESSORIES							
096513	RB-1	RUBBER BASE	MATCH EXISTING				
INTERIOR PAINT							
099600	HPC	HIGH PERFORMANCE COATING	SHERWIN WILLIAMS		SW7004 SNOWBOUND		
PLASTIC TOILET COMPARTMENT							
102113.19	TP-1	TOILET COMPARTMENT	SCRANTON PRODUCTS		SANDCASTLE OR BURGUNDY	N/A	LOCKER ROOM SHOWER PARTITIONS



31 A0.0 FINISH FLOOR PLAN - AREA B
SCALE: 1/4" = 1'-0"

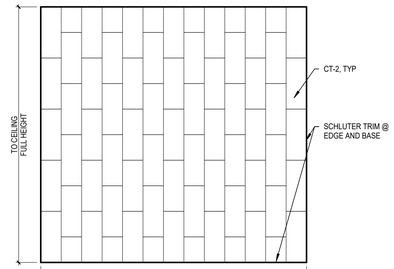


32 A0.0 FINISH FLOOR PLAN - AREA C
SCALE: 1/4" = 1'-0"



33 A0.0 FINISH FLOOR PLAN - AREA C
SCALE: 1/4" = 1'-0"

14 A0.0 TYP RESTROOM WET WALL
SCALE: 1/2" = 1'-0"



15 A0.0 TYP RESTROOM WALL
SCALE: 1/2" = 1'-0"

GENERAL NOTES

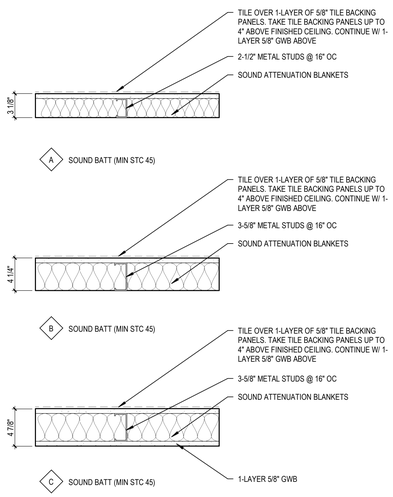
A. GENERAL NOTES APPLY TO ALL SHEETS.
B. DIMENSIONS ARE ACTUAL AND ARE TO FACE OF STUDS, FACE OF CONCRETE WALLS, FACE OF CMU WALLS, FACE OF FRAMES, OR CENTERLINE OF COLUMNS, UNLESS NOTED OTHERWISE.
C. FINISH FLOOR ELEVATIONS ARE SHOWN THUS: TYP. FIN. FL. EL. =
D. FLOOR SPOT ELEVATIONS ARE SHOWN THUS: XXX'-XX"
E. WALL TYPES SHALL BE DESIGNATED ON FLOOR PLANS THUS: ◇ 1 ◇ SEE SHEET A0.1 FOR WALL TYPES. ALL INTERIOR PARTITIONS ARE WALL TYPE "1" UNLESS NOTED OTHERWISE.
F. ALL MASONRY WALLS AND INTERIOR STUD WALLS SHALL EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK ABOVE UNLESS NOTED OTHERWISE. SEE REFLECTED CEILING PLAN NOTES.
G. PROVISIONS SHALL BE MADE AT ALL FULL HEIGHT NON-BEARING WALLS FOR 1-INCH VERTICAL MOVEMENT OF THE BUILDING STRUCTURE WITHOUT TRANSFER OF COMPRESSIVE LOADS TO WALL. FILL IRREGULARITIES BETWEEN TOP OF WALL AND DECK ABOVE WITH FIRE SAFING INSULATION OR FIRE STOPPING MATERIALS AS REQUIRED TO MEET FIRE RATING OF RESPECTIVE WALLS. SEE DETAILS ON SHEET CP0.1.
H. SEE SHEET CP1.1 FOR LOCATION OF WALLS OF FIRE-RESISTIVE CONSTRUCTION. ALL WALLS OF FIRE-RESISTIVE CONSTRUCTION SHALL EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK ABOVE.
I. ALL PENETRATIONS THROUGH WALLS SHALL BE SEALED WITH THRU-WALL FIRE STOPPING MATERIAL AS REQUIRED TO ACHIEVE THE RESPECTIVE FIRE-RESISTIVE RATING AND SMOKE STOPPAGE. SEE SPECIFICATION SECTION 078413.
J. SEE STRUCTURAL DRAWINGS FOR BRACING OF NON-LOAD BEARING MASONRY WALLS.
K. FURNISH AND INSTALL FIRE-TREATED WOOD BLOCKING OR METAL BACKING PLATE IN METAL STUD PARTITIONS FOR THE PROPER ANCHORAGE OF ALL WALL ATTACHED ITEMS; I.E. TOILET ACCESSORIES, CASEWORK, MILLWORK, WALL-MOUNTED FIXTURES, MARKER BOARDS, TACK BOARDS, DOOR STOPS, AUDIO VISUAL BRACKETS, ETC.
L. GYPSUM BOARD AND PLASTER SURFACES SHALL BE ISOLATED WITH CONTROL JOINTS WHERE SHOWN ON DRAWINGS AND AS DESCRIBED IN THE SPECIFICATIONS.
M. THE OWNER SHALL FURNISH AND INSTALL THE FOLLOWING ITEMS: 1.??? 2. ???
N. INCLUDE ALL OWNER FURNISHED AND INSTALLED ITEMS AND OWNER FURNISHED AND CONTRACTOR INSTALLED ITEMS IN THE CONSTRUCTION SCHEDULE, AND SHALL COORDINATE WITH THE OWNER TO ACCOMMODATE THESE ITEMS.
O. COORDINATE ALL MECHANICAL CHASE SIZES WITH THE MECHANICAL CONTRACTOR.
P. COORDINATE WITH MECHANICAL AND ELECTRICAL CONTRACTORS THE SIZE AND LOCATION OF EQUIPMENT PADS SHOWN ON PLANS.
Q. ARCHITECTURAL FINISH FLOOR ELEVATION IS 100'-0".
R. EXTEND FURRING CHANNELS AND GYPSUM BOARD UP 4 INCHES ABOVE FINISHED CEILING ON CMU WALLS.
S. FIRE RATED ENCLOSURES AROUND ALL STEEL COLUMNS SHALL BE CONTINUOUS FROM FLOOR TO UNDERSIDE OF FLOOR OR ROOF DECK ABOVE FOR EACH LEVEL.
T. SCRIBE GYPSUM WALL BOARD OF WALLS AND PARTITIONS TO IRREGULARITIES OF DECK ABOVE. SEAL TIGHTLY AROUND ALL PENETRATIONS.
U. PROVIDE SEISMIC BRACING FOR SUSPENDED CEILINGS OR AS SHOWN ON THE DRAWINGS.

INTERIOR FINISH PLAN GENERAL NOTES

A. INTERIOR FINISH PLAN GENERAL NOTES APPLY TO ALL INTERIOR FINISH PLAN SHEETS.
B. FLOOR PATTERN DIMENSIONS AND LOCATIONS ARE APPROXIMATE. MINOR ADJUSTMENTS MAY BE MADE FOR LAYOUT AND TO MINIMIZE WASTE AS LONG AS THE DESIGN INTENT IS MAINTAINED.
C. SEE SPECIFICATION FOR PAINTING OF ITEMS NOT NOTED ON FINISH PLANS OR ELEVATIONS.
D. CEILING HEIGHTS, AS NOTED ON THE REFLECTED CEILING PLANS, ARE MEASURED FROM FINISH FLOOR OF SCHEDULED ROOM.
E. WHERE FLOOR FINISH CHANGES FROM ONE ROOM TO ANOTHER, SET JOINT OF THE MATERIALS AT THE CENTER OF THE COMMUNICATING DOOR, UNO. SEE A0.0 SERIES SHEETS FOR TYPICAL FLOOR TRANSITION DETAILS.
F. SEE INTERIOR MATERIALS SCHEDULE FOR BASIS OF DESIGN PRODUCT INFORMATION AND DESIGNATIONS.
G. SEE A0.0 SERIES SHEETS FOR FLOOR PATTERNS, TRANSITIONS, AND DIRECTION.
H. SEE A0.0 SERIES SHEETS FOR LOCATIONS AND EXTENTS OF FINISH MATERIALS AND DETAILS.

INTERIOR FINISH PLAN SYMBOL LEGEND

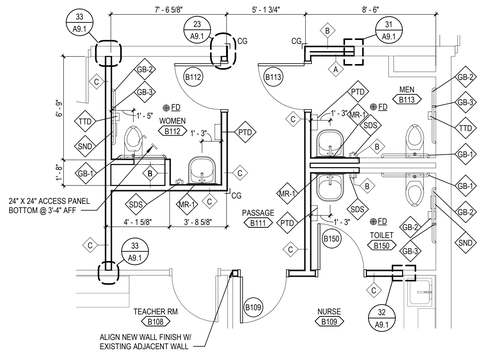
PT-1 — FLOOR FINISH MATERIAL KEYNOTE
SC X PT — FLOOR FINISH TRANSITION KEYNOTE
HPC-1 — WALL FINISH MATERIAL KEYNOTE



WALL TYPE NOTES

A. SEE CP SERIES SHEETS FOR LOCATIONS OF FIRE/SMOKE RATED WALLS.
B. CONSTRUCT FIRE RATED GWB PARTITIONS ACCORDING TO THE FIRE RATED ASSEMBLIES INDICATED ON THE WALL TYPE.
C. SEE DETAIL 51/CP0.1 FOR GWB PARTITION SLIP CONNECTION BELOW FLOOR AND ROOF DECKS.
D. SEE DETAIL 51/A9.1 FOR CONTROL JOINT LOCATIONS AT DOOR FRAMES LOCATED IN GWB PARTITIONS.
E. SOUND WALLS ARE INDICATED BY THE STC RATING BELOW THE WALL TYPE. SEE DETAIL 51/CP0.1 FOR ADDITIONAL DETAIL AT SOUND WALLS. THE PERIMETER OF ALL SOUND WALLS SHALL BE SEALED WITH ACOUSTICAL SEALANT.
F. SEE DETAIL 51/A9.1 FOR NON-STRUCTURAL METAL STUD FRAMING DETAILS.
G. REFER TO GENERAL NOTES ON SHEET A0.1 FOR ADDITIONAL REQUIREMENTS REGARDING GWB PARTITIONS.

WALL TYPES
SCALE: 1 1/2" = 1'-0"



53 A0.0 LARGE SCALE PLAN - RESTROOMS
SCALE: 1/4" = 1'-0"

TOILET ACCESSORIES SCHEDULE

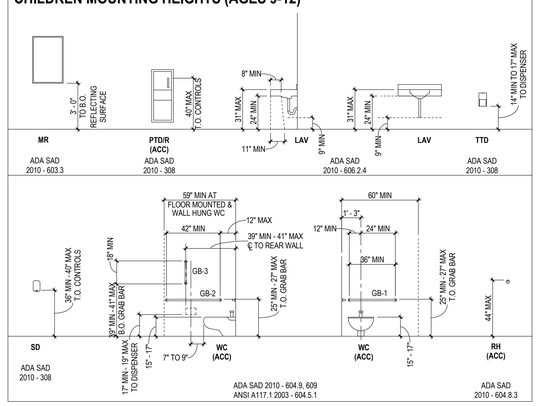
PLAN SYMBOL	DESCRIPTION	MOUNTING HEIGHT	PLAN SYMBOL	DESCRIPTION	MOUNTING HEIGHT
GB-1	GRAB BAR (BACK WALL)	36 INCHES TO TOP	PTD	PAPER TOWEL DISPENSER (OFOI)	40 INCHES TO BOTTOM
GB-2	GRAB BAR (SIDE WALL)	36 INCHES TO TOP	SD	SOAP DISPENSER (OFOI)	VERIFY WITH OWNER BUT NOT MORE THAN 48 INCHES TO TOP
GB-3	GRAB BAR (SIDE WALL, VERTICAL)	40 INCHES TO BOTTOM, 40" FROM BACK WALL	SND	SANITARY NAPKIN DISPOSAL (OFOI)	30 INCHES TO TOP
MR-1	MIRROR (18"x36")	40 INCHES TO BOTTOM OF REFLECTIVE SURFACE	TTD	TOILET TISSUE DISPENSER (OFOI)	20 INCHES TO TOP

NOTES:
1. ALL MOUNTING HEIGHTS AND LOCATIONS SHALL BE IN ACCORDANCE WITH PROJECT ACCESSIBILTY CODES.
2. SEE 1/I8" FLOOR PLANS FOR ALL TOILET ACCESSORIES SCHEDULED THAT ARE NOT SHOWN ON LARGE SCALE PLANS.
3. OWNER-FURNISHED OWNER-INSTALLED (OFOI) ITEMS AS INDICATED IN TOILET ACCESSORIES SCHEDULE.

GENERAL NOTES FOR ACCESSIBILITY

A. ACCESSIBLE URINAL SHALL PROVIDE CLEAR FLOOR SPACE PER ADA SAD 2010 - 605.3
B. ACCESSIBLE WATER CLOSETS SHALL PROVIDE CLEAR SPACE PER ADA SAD 2010 - 604.3.1
C. ACCESSIBLE LAVATORIES AND SINKS SHALL PROVIDE CLEAR SPACE PER ADA SAD 2010 - 606.2
D. ACCESSIBLE TOILET ROOMS SHALL PROVIDE A TURNING SPACE OF 60 INCHES IN DIAMETER PER ADA SAD 2010 - 304.3.1
E. ACCESSIBLE WATER FOUNTAINS SHALL PROVIDE CLEAR FLOOR SPACE PER ADA SAD 2010 - 602.2
F. ACCESSIBLE TOILET PARTITIONS SHALL COMPLY WITH ADA SAD 2010 - 604.8.1
G. EXPOSED PIPES AND SURFACES UNDER LAVATORIES AND SINKS SAHLL BE INSULATED PER ADA SAD 2010 - 606.5

CHILDREN MOUNTING HEIGHTS (AGES 9-12)



Children Ages 9-12 - ADA SAD 2010
SCALE: 1/4" = 1'-0"

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INTERIORS MATERIAL SCHEDULE AND NOTES

A0.0

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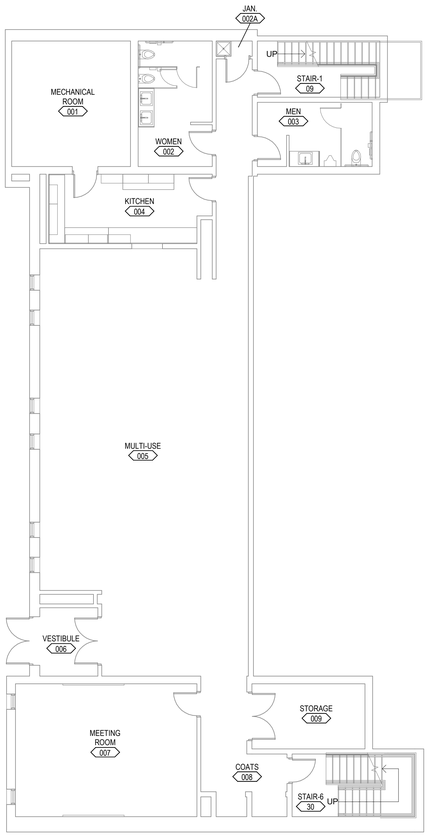
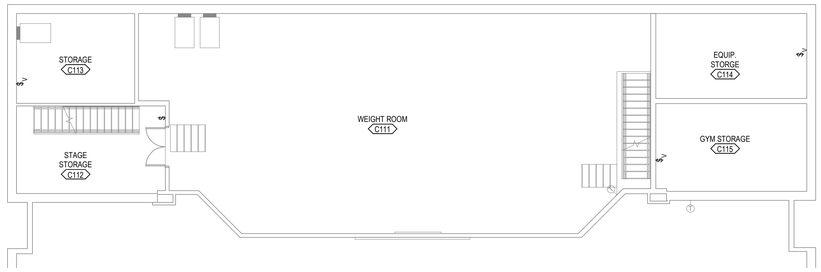


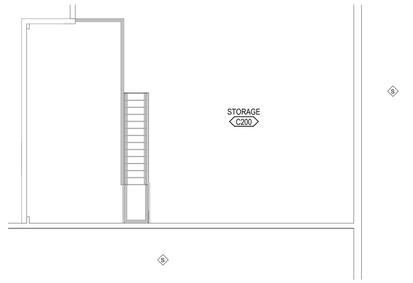
EXISTING LOWER LEVEL - AREA A

NORTH SCALE: 1/8" = 1'-0"



EXISTING WEIGHT ROOM STORAGE - AREA C

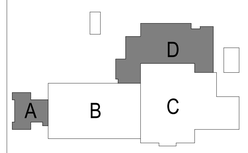
NORTH SCALE: 1/8" = 1'-0"



EXISTING WOOD SHOP STORAGE - AREA C

NORTH SCALE: 1/8" = 1'-0"

KEY PLAN



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LOWER LEVEL - AREA A AND EXISTING STORAGE

A1.0

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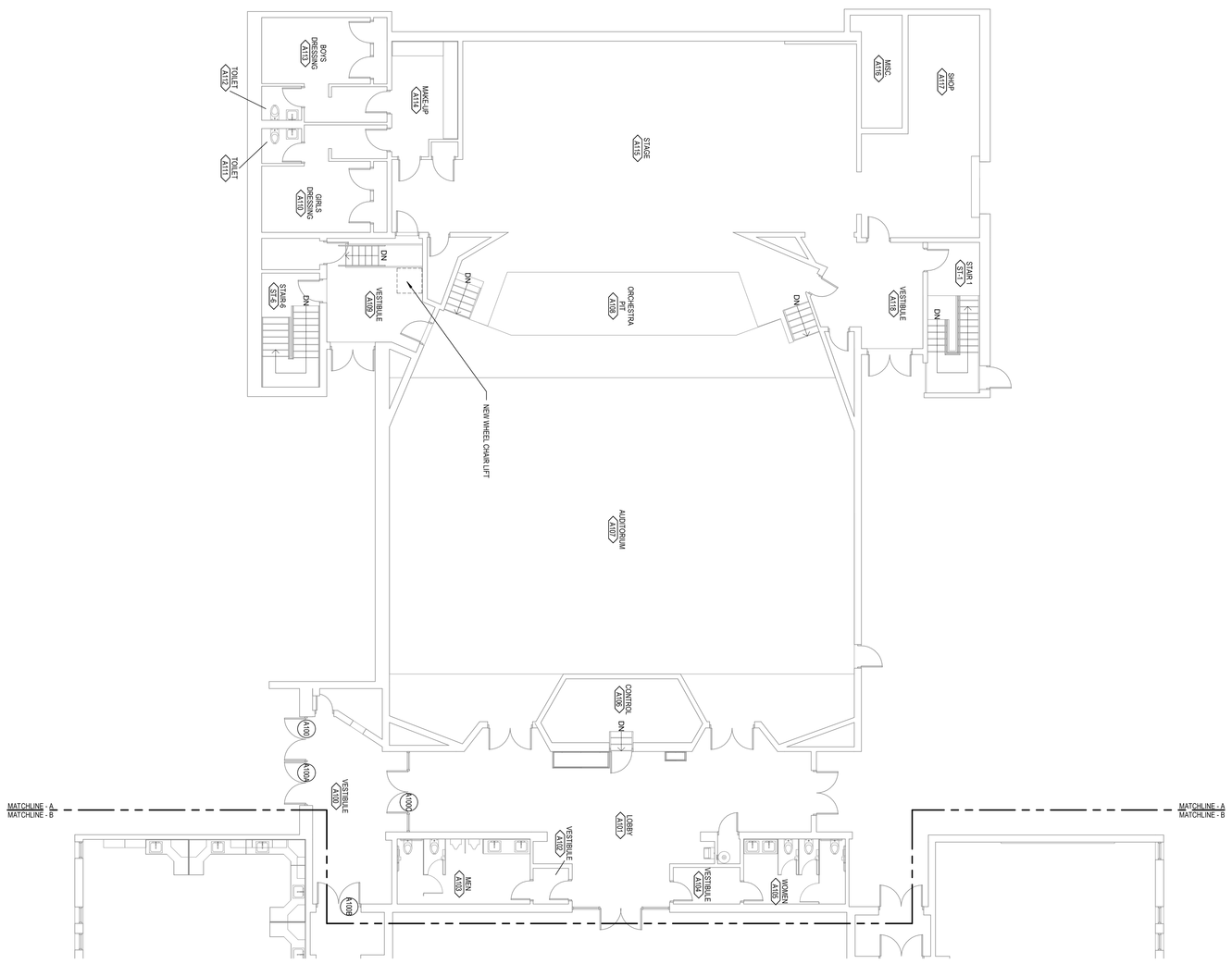
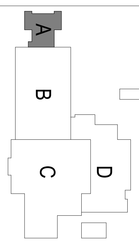
NORTH

FLOOR PLAN - AREA A

SCALE: 1/8" = 1'-0"



KEY PLAN



SHENANDOAH HIGH SCHOOL RENOVATIONS

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FLOOR PLAN - AREA A

A1.1A

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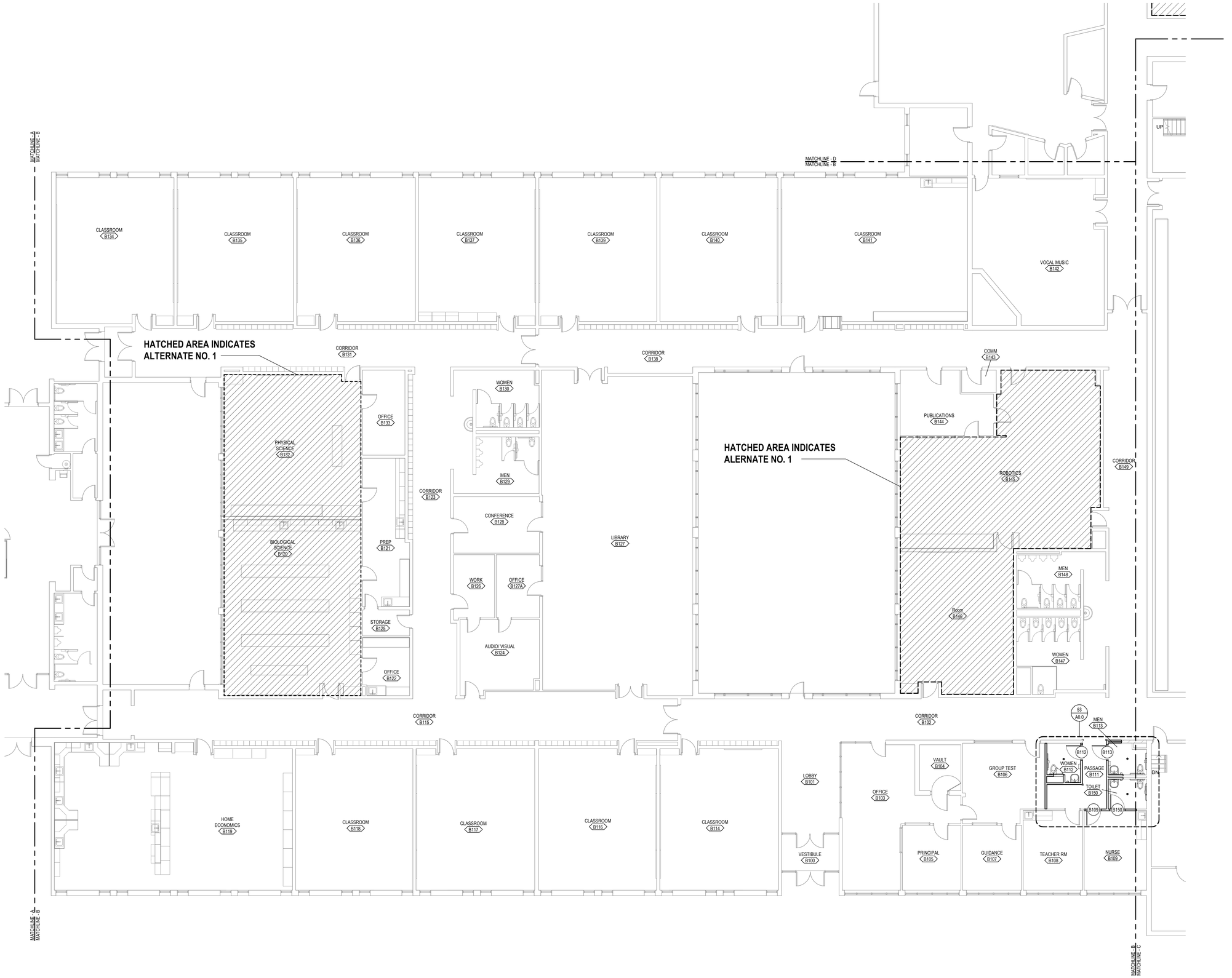
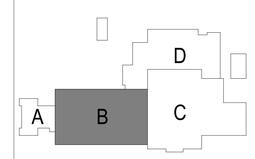


FLOOR PLAN - AREA B

SCALE: 1/8" = 1'-0"

NORTH

KEY PLAN



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FLOOR PLAN - AREA B

A1.1B

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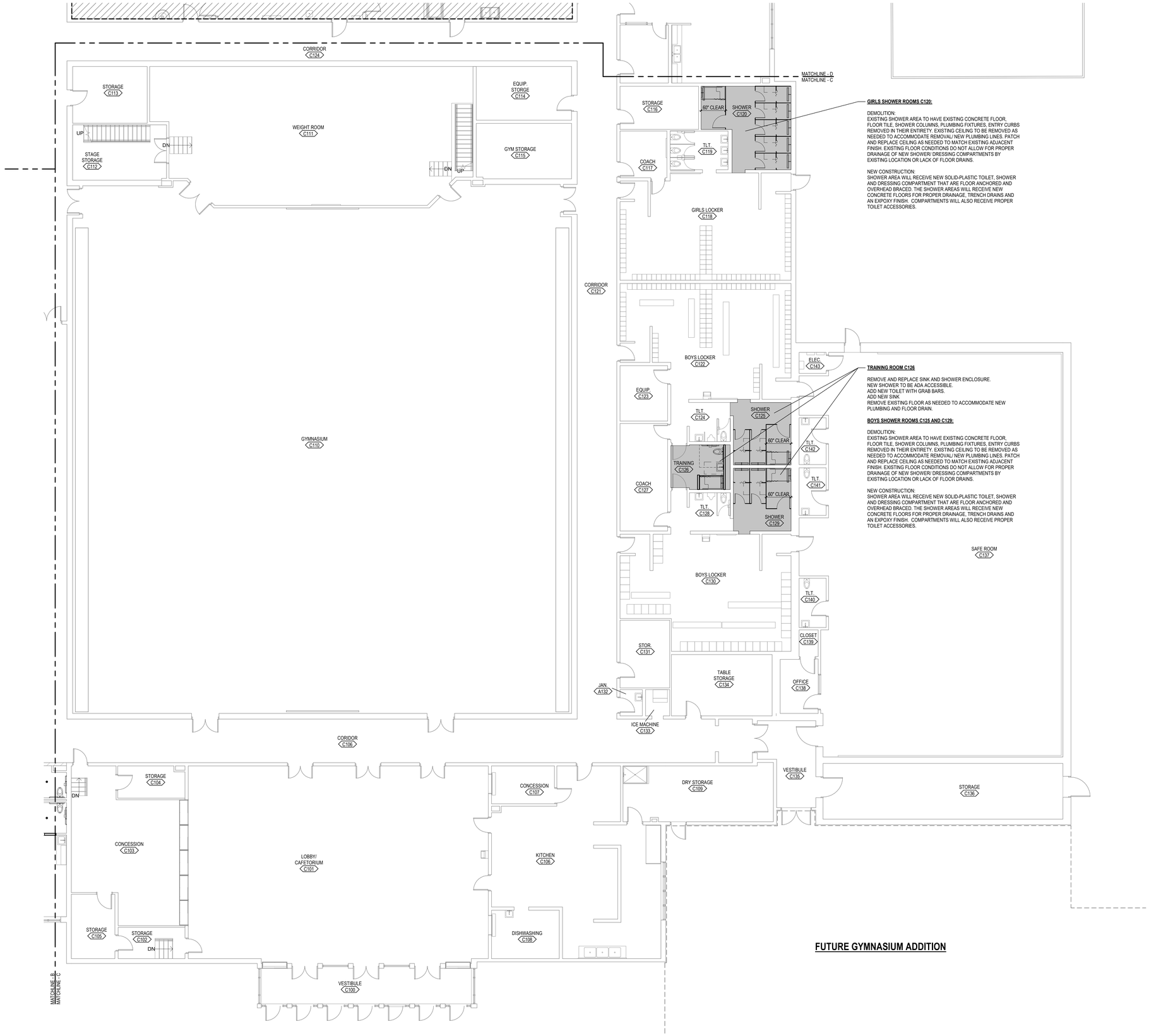


GIRLS SHOWER ROOMS C120:

DEMOLITION:
EXISTING SHOWER AREA TO HAVE EXISTING CONCRETE FLOOR, FLOOR TILE, SHOWER COLUMNS, PLUMBING FIXTURES, ENTRY CURBS REMOVED IN THEIR ENTIRETY. EXISTING CEILING TO BE REMOVED AS NEEDED TO ACCOMMODATE REMOVAL/ NEW PLUMBING LINES. PATCH AND REPLACE CEILING AS NEEDED TO MATCH EXISTING ADJACENT FINISH. EXISTING FLOOR CONDITIONS DO NOT ALLOW FOR PROPER DRAINAGE OF NEW SHOWER/ DRESSING COMPARTMENTS BY EXISTING LOCATION OR LACK OF FLOOR DRAINS.

NEW CONSTRUCTION:
SHOWER AREA WILL RECEIVE NEW SOLID-PLASTIC TOILET, SHOWER AND DRESSING COMPARTMENT THAT ARE FLOOR ANCHORED AND OVERHEAD BRACED. THE SHOWER AREAS WILL RECEIVE NEW CONCRETE FLOORS FOR PROPER DRAINAGE, TRENCH DRAINS AND AN EXPOXY FINISH. COMPARTMENTS WILL ALSO RECEIVE PROPER TOILET ACCESSORIES.

TRAINING ROOM C126

REMOVE AND REPLACE SINK AND SHOWER ENCLOSURE.
NEW SHOWER TO BE ADA ACCESSIBLE.
ADD NEW TOILET WITH GRAB BARS.
ADD NEW SINK
REMOVE EXISTING FLOOR AS NEEDED TO ACCOMMODATE NEW PLUMBING AND FLOOR DRAIN.

BOYS SHOWER ROOMS C125 AND C129:

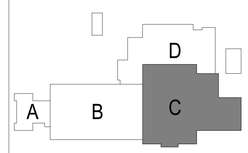
DEMOLITION:
EXISTING SHOWER AREA TO HAVE EXISTING CONCRETE FLOOR, FLOOR TILE, SHOWER COLUMNS, PLUMBING FIXTURES, ENTRY CURBS REMOVED IN THEIR ENTIRETY. EXISTING CEILING TO BE REMOVED AS NEEDED TO ACCOMMODATE REMOVAL/ NEW PLUMBING LINES. PATCH AND REPLACE CEILING AS NEEDED TO MATCH EXISTING ADJACENT FINISH. EXISTING FLOOR CONDITIONS DO NOT ALLOW FOR PROPER DRAINAGE OF NEW SHOWER/ DRESSING COMPARTMENTS BY EXISTING LOCATION OR LACK OF FLOOR DRAINS.

NEW CONSTRUCTION:
SHOWER AREA WILL RECEIVE NEW SOLID-PLASTIC TOILET, SHOWER AND DRESSING COMPARTMENT THAT ARE FLOOR ANCHORED AND OVERHEAD BRACED. THE SHOWER AREAS WILL RECEIVE NEW CONCRETE FLOORS FOR PROPER DRAINAGE, TRENCH DRAINS AND AN EXPOXY FINISH. COMPARTMENTS WILL ALSO RECEIVE PROPER TOILET ACCESSORIES.

FLOOR PLAN - AREA C

NORTH
SCALE: 1/8" = 1'-0"

KEY PLAN



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FLOOR PLAN - AREA C

A1.1C

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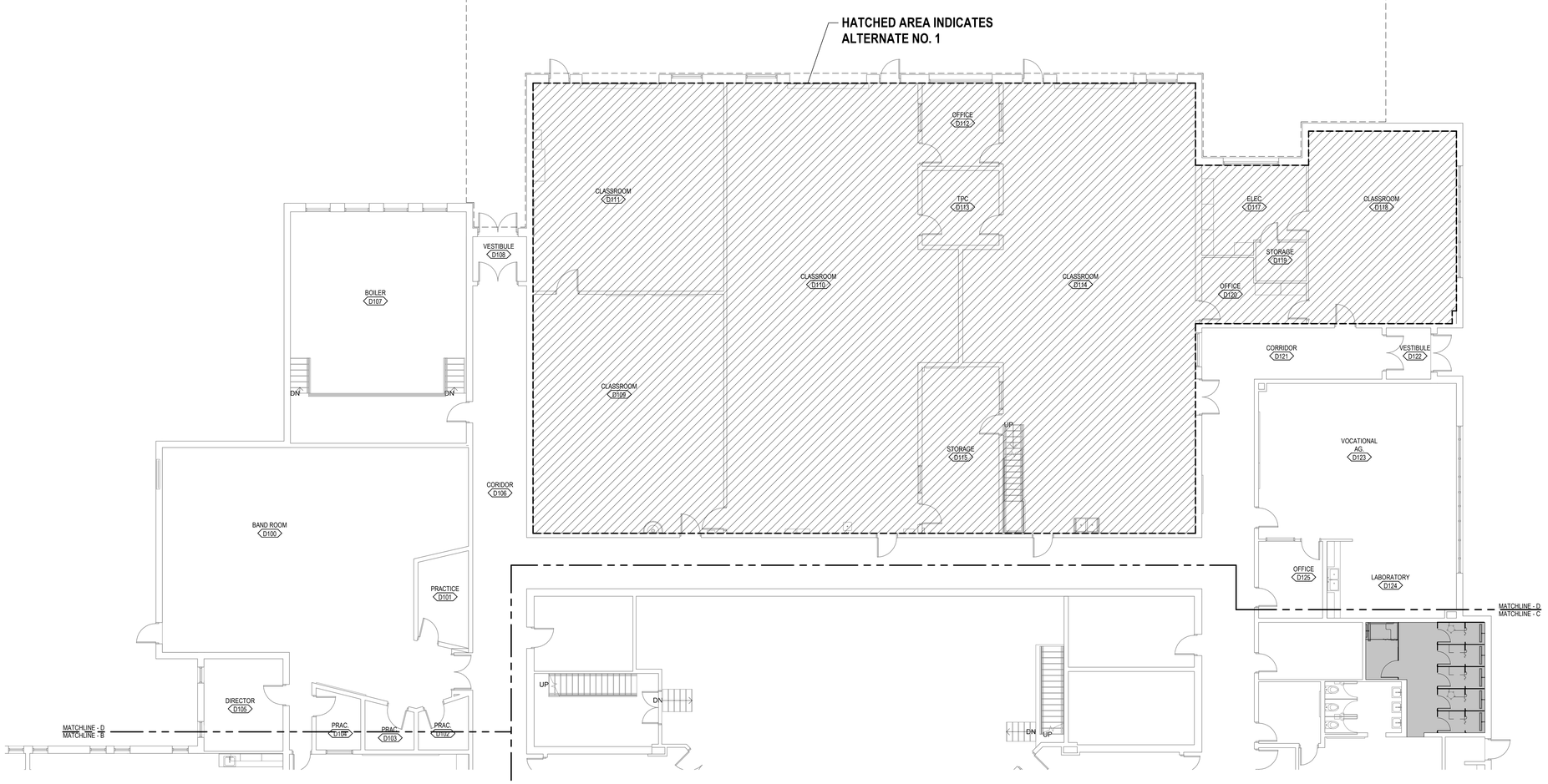
POSSIBLE FUTURE CTE ADDITION

HATCHED AREA INDICATES
ALTERNATE NO. 1

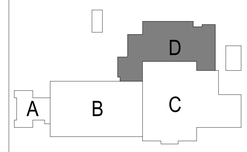


FLOOR PLAN - AREA D

SCALE: 1/8" = 1'-0"

NORTH

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT
09-25-19
Revisions

11-16116-20

FLOOR PLAN - AREA D

A1.1D

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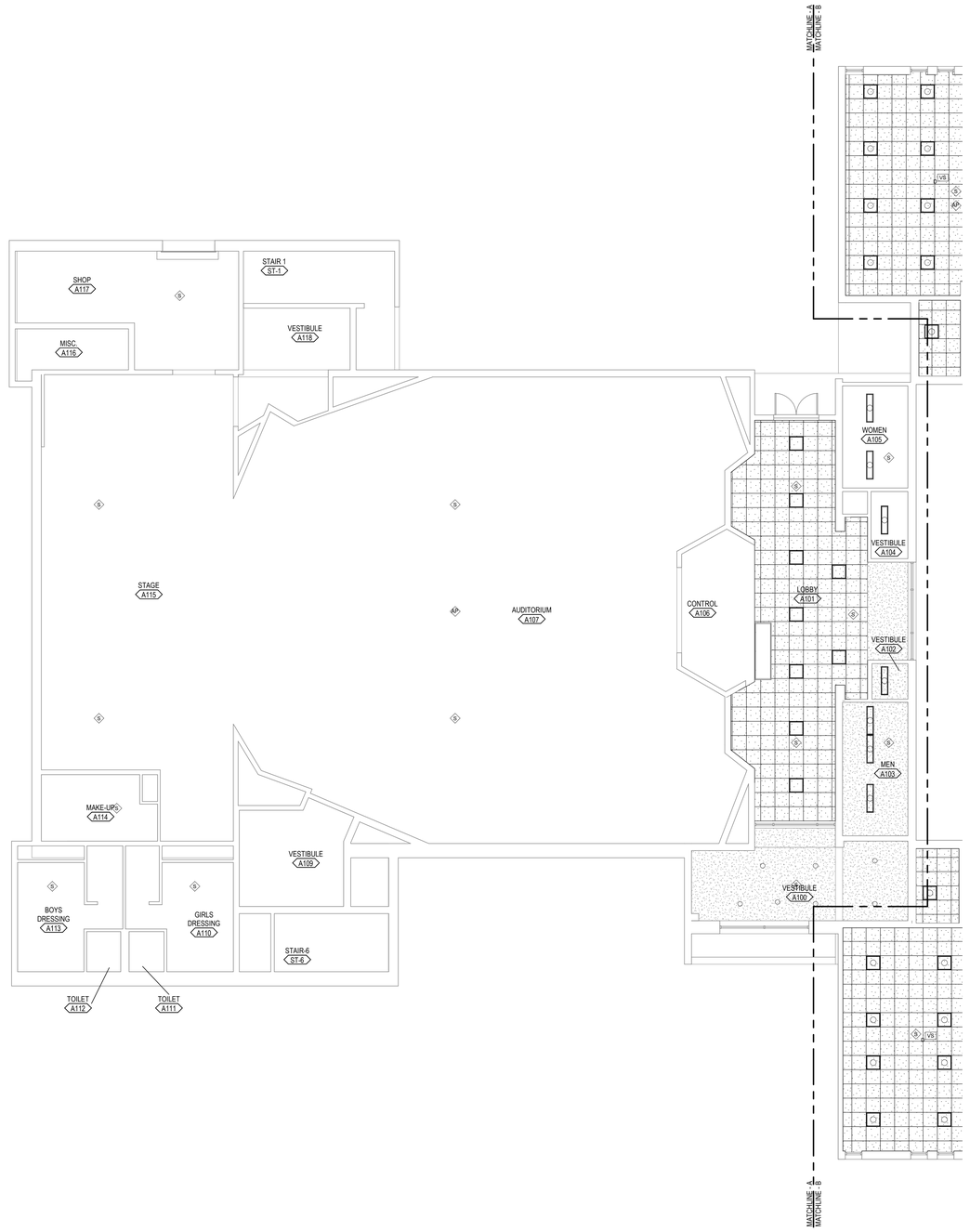
REFLECTED CEILING PLAN GENERAL NOTES

A. REFLECTED CEILING PLAN GENERAL NOTES APPLY TO ALL REFLECTED CEILING PLAN SHEETS.
B. ALL CEILING GRIDS/PANELS SHALL BE CENTERED IN EACH ROOM UNLESS NOTED OTHERWISE.
C. CEILING HEIGHTS ARE AS NOTED ON THE REFLECTED CEILING PLAN UNLESS NOTED OTHERWISE.
D. ALL ELECTRICAL FIXTURES, SPEAKERS, SMOKE AND THERMAL DETECTORS, MECHANICAL GRILLES, SPRINKLER HEADS, ETC. SHALL BE CENTERED BETWEEN CEILING GRIDS UNLESS NOTED OTHERWISE. SPRINKLER HEADS SHALL BE WITHIN A 3" RADIUS CENTERED BETWEEN CEILING GRIDS.
E. IN ACOUSTICAL CEILING PANELS WITH SCORE IN THE CENTER, CENTER DEVICES REFERENCED IN NOTE D IN ONE HALF OF THE TILE. DO NOT LOCATE ON THE SCORE. FOR APC WITH MULTIPLE SCORED PATTERNS, COORDINATE LOCATION WITH ARCHITECT.
F. PROVIDE SUSPENSION SYSTEM AROUND ELECTRICAL FIXTURES, MECHANICAL GRILLES, DIFFUSERS, ETC. AT ACOUSTICAL PANEL CEILINGS.
G. ALL DIMENSIONS ON REFLECTED CEILING PLANS ARE ACTUAL AND ARE TO THE FOLLOWING UNLESS NOTED OTHERWISE:
   1. FACE OF FINISHED WALL
   2. FACE OF FINISHED BULKHEADS
   3. CENTERLINE OF COLUMNS
   4. CENTERLINE OF TEES
H. IN AREAS WITH EXPOSED STRUCTURE CEILINGS, COORDINATE EXACT LOCATIONS OF MECHANICAL GRILLES, DIFFUSERS, DUCTWORK AND ELECTRICAL FIXTURES WITH EACH RESPECTIVE SUBCONTRACTOR.
I. ALL WALLS EXTEND TO UNDERSIDE OF DECK EXCEPT THOSE SHOWN SHADED IN WHICH GYPSUM BOARD OR MASONRY EXTENDS MIN 4" ABOVE FINISHED CEILING. ALL METAL STUDS EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK.

APC-1
NEW CEILING PANEL, REUSE OF GRID

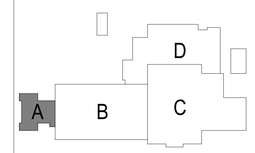


NORTH

REFLECTED CEILING PLAN - AREA A

SCALE: 1/8" = 1'-0"

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT
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REFLECTED CEILING PLAN - AREA A

A3.1A

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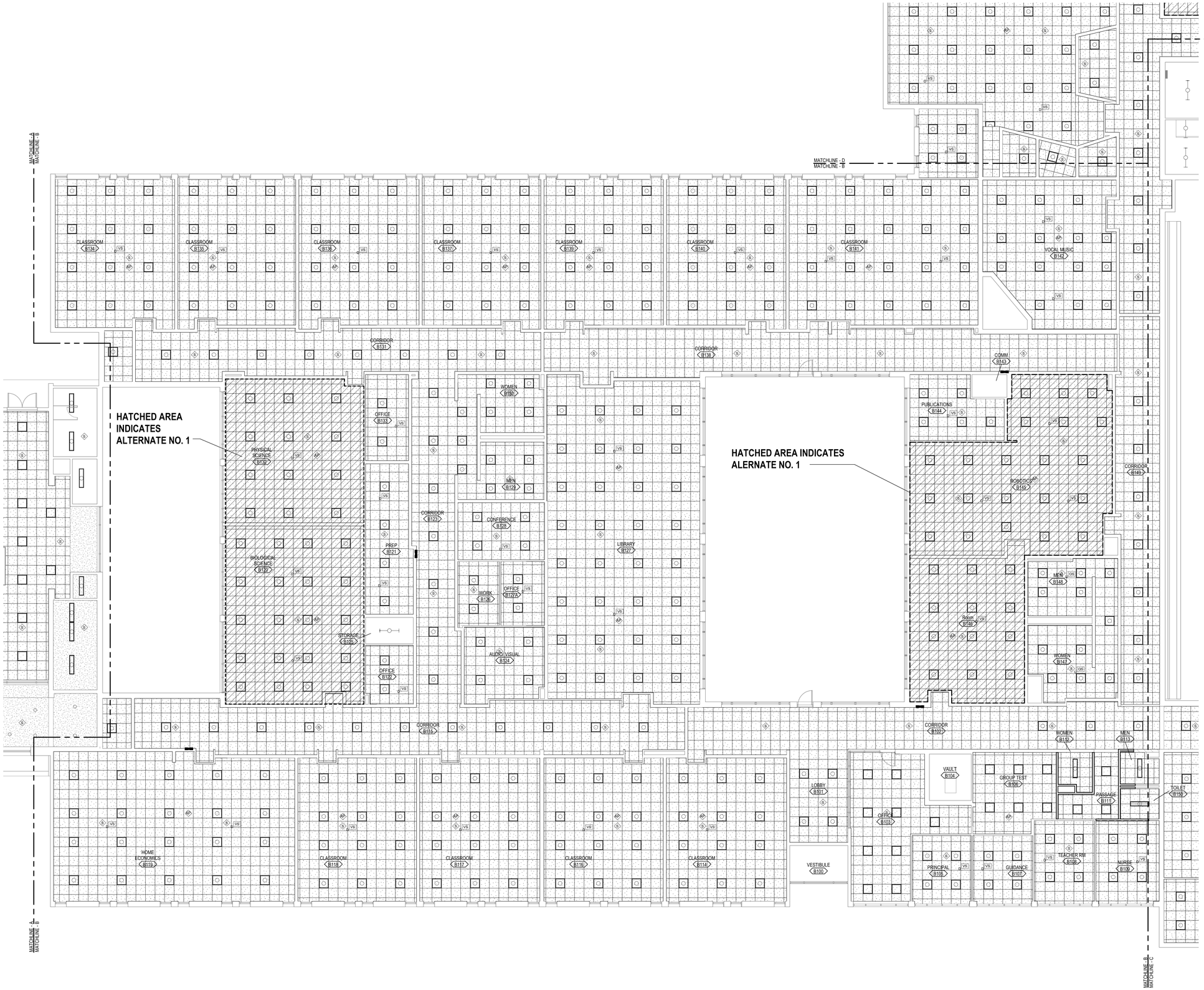
GENERAL SHEET NOTES:

1. SEE SHEET A3.1A FOR GENERAL REFLECTED CEILING PLAN NOTES.

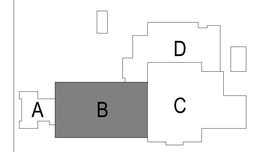


REFLECTED CEILING PLAN - AREA B

NORTH

SCALE: 1/8" = 1'-0"

KEY PLAN



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REFLECTED CEILING PLAN - AREA B

A3.1B

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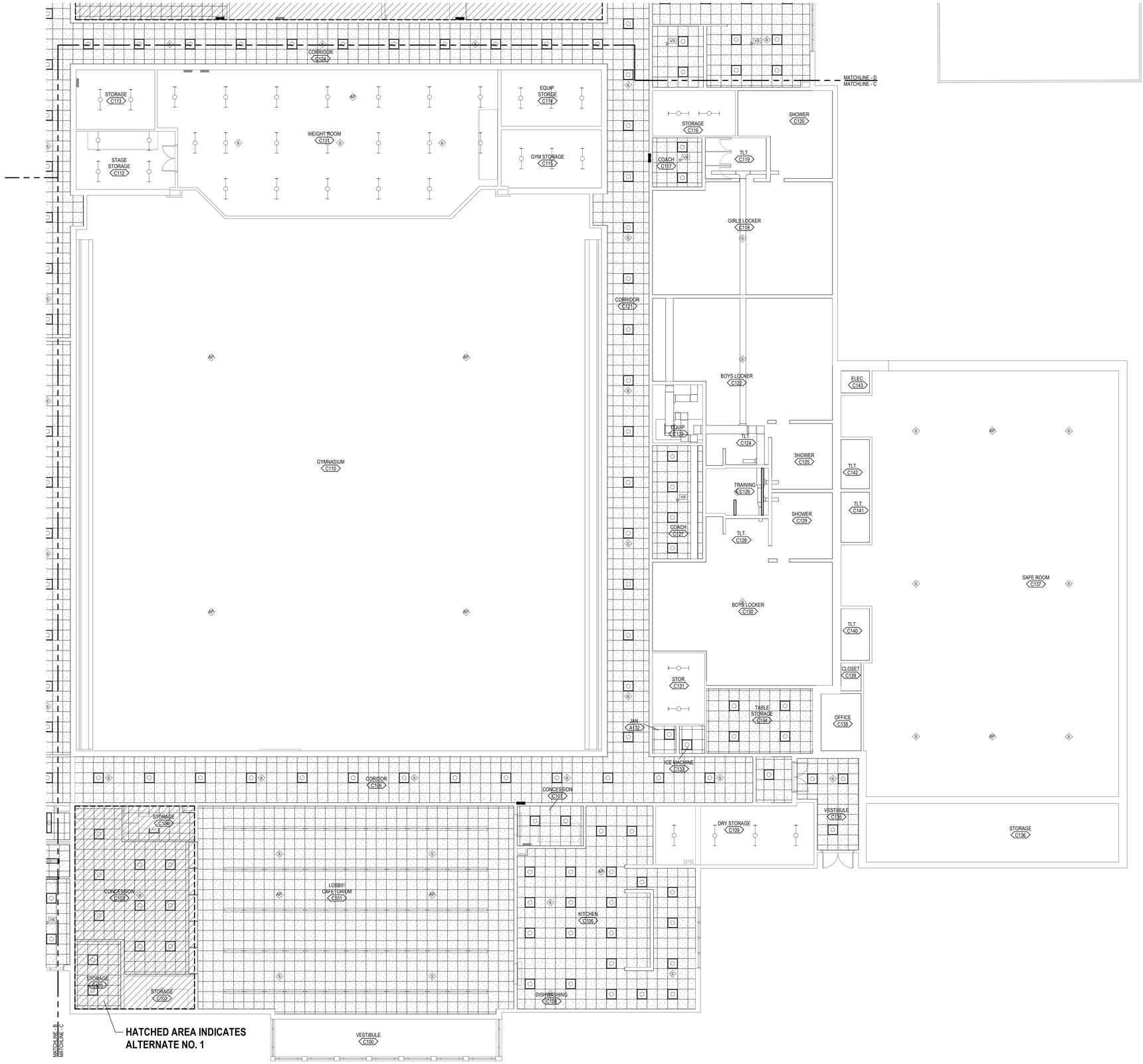
GENERAL SHEET NOTES:

1. SEE SHEET A3.1A FOR GENERAL REFLECTED CEILING PLAN NOTES.

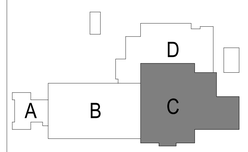


REFLECTED CEILING PLAN - AREA C

NORTH

SCALE: 1/8" = 1'-0"

KEY PLAN



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SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT
09-25-19
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REFLECTED CEILING PLAN - AREA C

A3.1C

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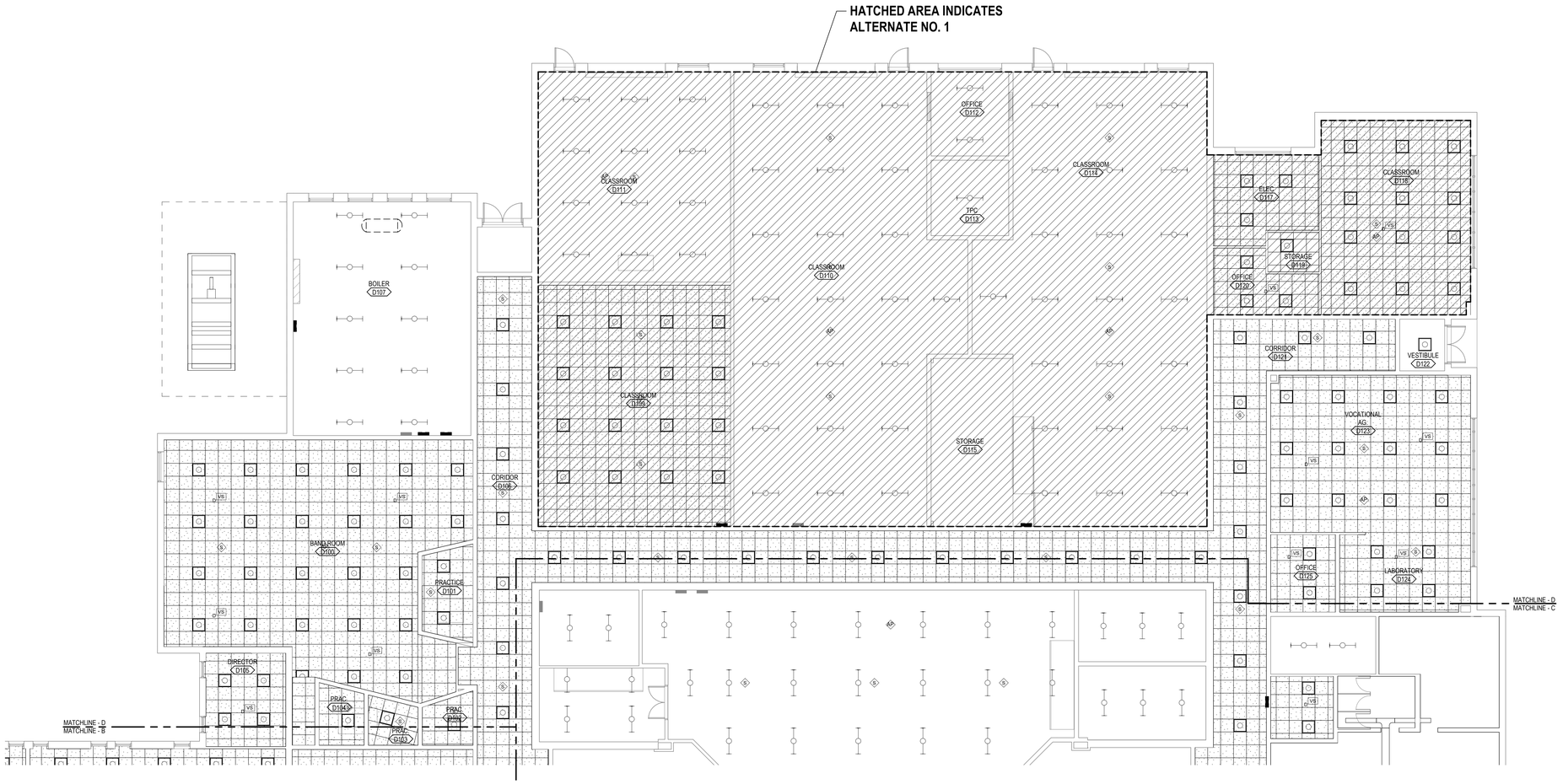
GENERAL SHEET NOTES:

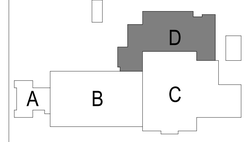
1. SEE SHEET A3.1A FOR GENERAL REFLECTED CEILING PLAN NOTES.



REFLECTED CEILING PLAN - AREA D

SCALE: 1/8" = 1'-0"

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT

09-25-19

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REFLECTED CEILING PLAN - AREA D

A3.1D

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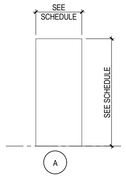
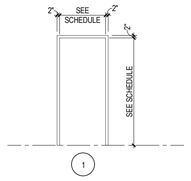
DOOR AND FRAME SCHEDULE

NUMBER	PANEL NO. OF PANELS	PANEL WIDTH	PANEL HEIGHT	PANEL THICKNESS	PANEL MATERIAL	PANEL GLASS	PANEL TYPE	FRAME DEPTH	FRAME MATERIAL	FRAME TYPE	FIRE RATING	HARDWARE SET	DETAILS HEAD	DETAILS JAMB LEFT	DETAILS JAMB RIGHT	DETAILS SILL	COMMENTS
A100	2	3' - 0"	0"	2"	GLASS (1)			4 1/2"	ALUM								EXISTING DOOR/FRAME TO RECEIVE NEW HARDWARE
A100A	2	3' - 0"	0"	2"	GLASS (1)			4 1/2"	ALUM								EXISTING DOOR/FRAME TO RECEIVE NEW HARDWARE
A100B	2	3' - 0"	7' - 0"	1 3/4"	HM			5 3/4"	HM								EXISTING DOOR/FRAME TO RECEIVE NEW HARDWARE
A100C	2	3' - 0"	0"	2"	GLASS (1)			4 1/2"	ALUM								EXISTING DOOR/FRAME TO RECEIVE NEW HARDWARE
B109	1	3' - 0"	7' - 0"	1 3/4"	HM		A	5 3/4"	HM	1			21/A9.1	22/A9.1	22/A9.1		
B112	1	3' - 0"	7' - 0"	1 3/4"	HM		A	5 3/4"	HM	1			21A9.1	23/A9.1	22/A9.1		THRESHOLD AT DOOR
B113	1	3' - 0"	7' - 0"	1 3/4"	HM		A	5 3/4"	HM	1			21/A9.1	22/A9.1	22/A9.1		THRESHOLD AT DOOR
B150	1	3' - 0"	7' - 0"	1 3/4"	HM		A	5 3/4"	HM	1			21/A9.1	22/A9.1	22/A9.1		THRESHOLD AT DOOR



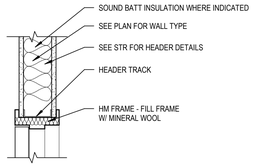
DOOR TYPES
SCALE: 1/4" = 1'-0"



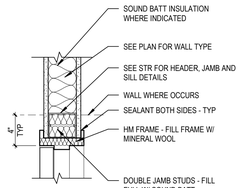
INTERIOR FRAME ELEVATIONS
SCALE: 1/4" = 1'-0"

DOOR AND FRAME SCHEDULE GENERAL NOTES

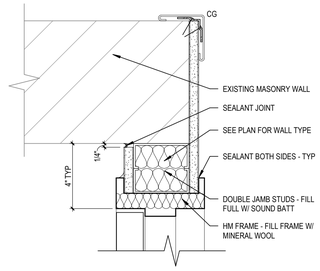
A. ALL HOLLOW METAL FRAMES SET IN MASONRY AND CONCRETE WALLS SHALL BE GROUTED SOLID. SEE DETAIL XX/AX.X FOR GROUTING.EXTERIOR DOOR FRAMES WITH SECURITY/ACCESS CONTROL HARDWARE AND SPECIFICATION SECTION 081113 FOR FURTHER REQUIREMENTS.
B. ALL HOLLOW METAL FRAMES SET IN METAL STUD WALLS SHALL BE FILLED WITH MINERAL WOOL BLANKET INSULATION.
C. ALL EXTERIOR FRAMES SHALL BE INSTALLED WITH 1/4" SHIM AND SEALANT AROUND PERIMETER OF FRAME.
D. MASONRY LINTELS AND STEEL LINTELS ARE SHOWN ON STRUCTURAL DRAWINGS.
E. GLASS TYPES FOR DOORS ARE INDICATED IN THE DOOR GLAZING COLUMN OF THE DOOR AND FRAME SCHEDULE. GLASS TYPES FOR FRAMES ARE INDICATED ON THE FRAME ELEVATIONS OR IN THE SPECIFICATIONS.
F. EXTERIOR FRAME TYPES ARE INDICATED WITH THE HEXAGON SYMBOL.
G. FOR COILING DOORS, GRILLES AND SECTIONAL DOORS, WIDTH AND HEIGHT DIMENSIONS SHOWN IN DOOR AND FRAME SCHEDULE REPRESENT FINISHED OPENING SIZE. CONTRACTOR TO COORDINATE EXACT SIZE OF DOOR WITH MANUFACTURER.
H. FRAME MANUFACTURER SHALL COORDINATE LOCATIONS OF ALL CONCEALED CONDUIT AND J-BOXES REQUIRED FOR SECURITY SYSTEM HARDWARE PRIOR TO MANUFACTURING OF HOLLOW METAL FRAMES AND COORDINATE WITH SECURITY HARDWARE AND DEVICES.
I. PROVIDE HEAD RECEIVERS AT ALUMINUM STOREFRONTS AND CURTAIN WALLS AS REQUIRED FOR STRUCTURAL DEFLECTION ALLOWANCE.
J. SEE SPECIFICATIONS HARDWARE SECTION FOR HARDWARE SETS NOTED IN DOOR AND FRAME SCHEDULE.



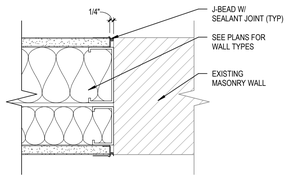
21 A9.1 HEAD DETAIL
SCALE: 1 1/2" = 1'-0"



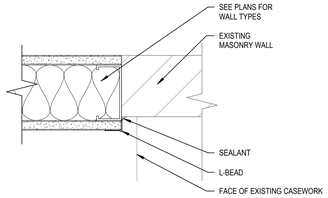
22 A9.1 JAMB DETAIL
SCALE: 1 1/2" = 1'-0"



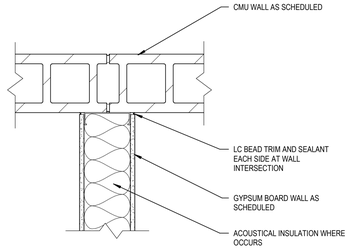
23 A9.1 JAMB DETAIL
SCALE: 3" = 1'-0"



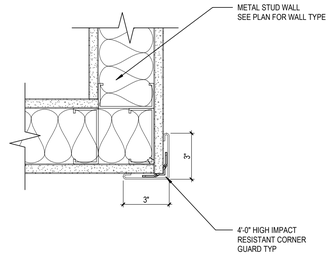
31 A9.1 PLAN DETAIL
SCALE: 3" = 1'-0"



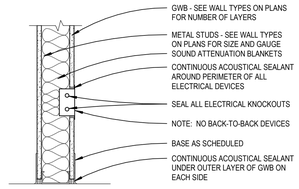
32 A9.1 PLAN DETAIL
SCALE: 3" = 1'-0"



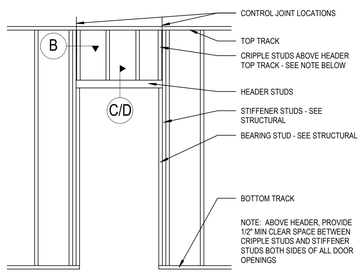
33 A9.1 TYPICAL WALL INTERSECTION
SCALE: 1 1/2" = 1'-0"



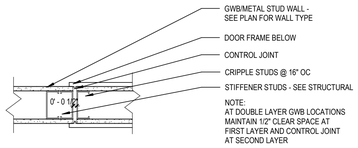
34 A9.1 CORNER GUARD DETAIL
SCALE: 3" = 1'-0"



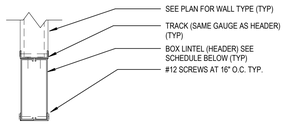
35 A9.1 SOUND WALL DETAIL
SCALE: 1 1/2" = 1'-0"



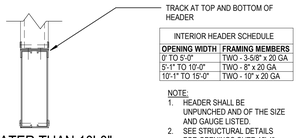
A TYP METAL STUD FRAMING AT DOOR OPENING
NO SCALE



B TYP GWB CONTROL JOINT ABOVE
SCALE: 1-1/2" = 1'-0"



C SPAN UP TO 10'-0"



INTERIOR HEADER SCHEDULE

OPENING WIDTH	FRAMING MEMBERS
0' TO 5'-0"	TWO - 3-5/8" x 20 GA
5'-1" TO 10'-0"	TWO - 8" x 20 GA
10'-1" TO 15'-0"	TWO - 10" x 20 GA

NOTE:
1. HEADER SHALL BE UNPUNCHED AND OF THE SIZE AND GAUGE LISTED.
2. SEE STRUCTURAL DETAILS FOR OPENINGS OVER 15'-1".

D SPAN GREATER THAN 10'-0"

51 A9.1 METAL STUD OPENINGS AND CONTROL JOINTS
SCALE: 1 1/2" = 1'-0"

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SHENANDOAH HIGH SCHOOL RENOVATIONS
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DOOR AND FRAME SCHEDULE

A9.1

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MECHANICAL (HVAC, PLUMBING AND FIRE PROTECTION) ABBREVIATIONS

#	NUMBER
&	AND
@	AT
°C	DEGREEES CELCIUS
°F	DEGREEES FAHRENHEIT
A	COMPRESSED AIR
A AMP	AMPERE
A/C	AIR CONDITIONING(ER)
AABC	ASSOCIATED AIR BALANCE COUNCIL
AAV	AUTOMATIC AIR VENT
ACC	ACCESSIBLE
ACCU	AIR COOLED CONDENSING UNIT
AD	AREA DRAIN
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITY ACT
ADDN	ADDITION OR ADDITIONAL
ADJ	ADJUSTABLE
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGF	AIR GAP FITTING
AHJ	AUTHORITY HAVING JURISDICTION
AHRI	AIR-CONDITIONING HEATING AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AI	AREA INLET
ALT	ALTERNATE
AMB	AMBIENT
AMBA	AMERICAN BOILER MANUFACTURERS ASSOCIATION
ANCH	ANCHOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	ACCESS PANEL
APPROX	APPROXIMATE
AR	ACID RESISTING
ARCH	ARCHITECTURAL
AS	AIR SEPARATOR
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASHRAE	AMERICAN SOCIETY OF HEATING REFRIGERATION AND AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AUTO	AUTOMATIC
AV	AUDIO-VIDEO, AUDIO-VISUAL
AV	ACID VENT
AV	AIR VENT
AW	ACID WASTE
AWG	AMERICAN WIRE GAUGE
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BAT	BATTERY
BBO	BOILER BLOW OFF
BC	BALANCING COCK
BC	BARE COPPER
BDD	BACK DRAFT DAMPER
BF	BOILER FEED
BFF	BELOW FINISH FLOOR
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BREAK HORSEPOWER
BLDG	BUILDING
BLKG	BLOCKING
BLKHD	BULKHEAD
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DUCT
BOT	BOTTOM
BPIP	BOILER PLANT INSTRUMENTATION PANEL
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	CONDUIT
C	CONDENSER WATER
CA	COMBUSTION AIR
CAP	CAPACITY
CD	CONDENSATE DRAIN
CD	CONSTRUCTION DOCUMENTS
CENT	CENTRIFUGAL
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CI	CAST IRON
CI	CURB INLET
CIP	CAST IRON PIPE
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CO	CLEAN OUT
CO	CARBON MONOXIDE
CO2	CARBON DIOXIDE
COMB	COMBINATION
COMM	COMMUNICATIONS
COMP	COMPRESSOR UNIT
CONC	CONCRETE
CONN(S)	CONNECTION(S)
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACT(OR)
CONV	CONVECTOR
CP	CONDENSATE PUMP
CPS	CYCLES PER SECOND
CR	CONDENSER WATER RETURN
CR	CORROSION RESISTANT
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CS	COUNTERSINK
CS	COMBINATION SEWER
CS	CONDENSER WATER SUPPLY
CSP	COMBINATION STANDPIPE
CT	COOLING TOWER
CTR	CENTER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CW	COLD WATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CYL	CYLINDER
D	DRAIN
D	DIFFUSER
D	DEPTH
DB	DECIBEL
DB	DRY BULB
DBL	DOUBLE
DC	DIRECT CURRENT
DC	DUST COLLECTOR
DE	DEIONIZED WATER
DEG	DEGREE
DEMO	DEMOLISH OR DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DFR	DIESEL FUEL RETURN
DFS	DIESEL FUEL SUPPLY
DFV	DIESEL FUEL VENT
DH	DUCT HEATER
DI	DISTILLED WATER
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISCH	DISCHARGE
DISTR	DISTRIBUTION
DIV	SPECIFICATION DIVISION
DN	DOWN
DSN	DOWNSPOUT NOZZLE
DSP	DRY STANDPIPE
DW	DISHWASHER
DWG(S)	DRAWING(S)
E	EAST
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EEW	EMERGENCY EYE WASH
EEWS	EMERGENCY EYE WASH SHOWER
EF	EXHAUST FAN
EFF	EFFICIENCY
EH	ELECTRICAL HEATER
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
ENG	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ESP	EXTERNAL STATIC PRESSURE
EST	ESTIMATE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPOSED
EXT	EXTERIOR
F	FAHRENHEIT
F	FIRELINE
F	FURNACE
F.V.	FIELD VERIFY
FA	FIRE ALARM
FA	FACE
FA	FRESH AIR
FAA	FIRE ALARM ANNUNCIATOR
FAB	FABRICATE(D)
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FD	FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FDNDR	FOUNDATION DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FIN	FINISHED
FIX	FIXTURE
FL	FLOOR
FLEX	FLEXIBLE
FM	FIRE MAIN
FM	FORCE MAIN
FME	FLOW MEASURING EQUIPMENT
FOF	FUEL OIL FILL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
FPD	FIRE PUMP DISCHARGE
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FS	FLOOR SINK
FSD	FIRE SMOKE DAMPER
FT	FEET
FT	FIN TUBE
FUT	FUTURE
FVC	FIRE VALVE CABINET
G	GRILLE
G	NATURAL GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GCO	GRADE CLEAN OUT
GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GHR	GLYCOL-WATER HEATING RETURN
GHS	GLYCOL-WATER HEATING SUPPLY
GOVT	GOVERNMENT
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
GW	GREASE WASTE
H	HEIGHT
HB	HOSE BIB
HCR	HOT/CHILLED WATER RETURN
HCS	HOT/CHILLED WATER SUPPLY
HGR	HANGER
HID	HIGH INTENSITY DISCHARGE
HORIZ	HORIZONTAL
HP	HORSE POWER
HP	HEAT PUMP
HP	HIGH PRESSURE
HPR	HIGH PRESSURE STEAM RETURN
HPS	HIGH PRESSURE STEAM SUPPLY
HR	HOUR
HTG	HEATING
HTR	HEATER
HTWR	HIGH TEMPERATURE HOT WATER RETURN
HTWS	HIGH TEMPERATURE HOT WATER SUPPLY
HUM	HUMIDIFIER
HV	HEATING VENTILATING UNIT
HVAC	HEATING VENTILATING AND AIR CONDITIONING
HW	DOMESTIC HOT WATER
HWC	DOMESTIC HOT WATER RECIRCULATING
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ (FREQUENCY)
i.e.	THAT IS
IAQ	INDOOR AIR QUALITY
IAW	IN ACCORDANCE WITH
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IES	ILLUMINATING ENGINEERING SOCIETY
IH	INTAKE HOOD
IN	INCH
INSUL	INSULATION
INT	INTERIOR
IP	IRON PIPE
IW	INDIRECT WASTE
JAN	JANITOR
JB	JUNCTION BOX
KH	KITCHEN HOOD
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LB(S)	POUND(S)
LF	LINEAR FOOT
LG	LENGTH (LONG)
LIN	LINEAR
LOX	LIQUID OXYGEN
LPG	LIQUIFIED PETROLEUM GAS
LPR	LOW PRESSURE STEAM RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LS	LAWN SPRINKLER
LTD	LINED TRANSFER DUCT
LV	LOUVER
LWT	LEAVING WATER TEMPERATURE
M	THOUSAND
MA	MIXED AIR
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAU	MAKEUP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MFRG	MANUFACTURING
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
ML	MOTORIZED LOUVER
MPG	MEDIUM PRESSURE GAS
MTD	MOUNTED
MTG	MOUNTING
MTWR	MEDIUM TEMP HOT WATER RETURN
MTWS	MEDIUM TEMP HOT WATER SUPPLY
MV	MEDICAL VACUUM
N	NITROGEN
N	NORTH
N2O	NITROUS OXIDE
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSN.
NIC	NOT IN CONTRACT
NO	NUMBER
NO2	NITROGEN DIOXIDE
NOM	NOMINAL
NTS	NOT TO SCALE
O&M	OPERATION AND MAINTENANCE
OA	OUTSIDE AIR
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
ORD	OVERFLOW ROOF DRAIN
OS&Y	OUTSIDE SCREW AND YOKE
OVFL	OVERFLOW
OVHD	OVERHEAD
OX	OXYGEN
P	PUMP
P/T	PRESSURE/TEMPERATURE TEST PORT
PAR	PARALLEL
PB	PULL BOX
PB	PUSH BUTTON
PC	PUMPED CONDENSATE
PCF	POUNDS PER CUBIC FOOT
PD	PRESSURE DROP
PD	PUMP DISCHARGE
PDI	PLUMBING & DRAINAGE INSTITUTE
PENT	PENTHOUSE
PERF	PERFORATED
PERP	PERPENDICULAR
PG	PRESSURE GAUGE
PI	POINT OF INTERSECTION
PI	PRESSURE INDICATOR
PIV	POST INDICATOR VALVE
PL	PLATE
PLBG	PLUMBING
PLYWD	PLYWOOD
PNEU	PNEUMATIC
PNL	PANEL
POC	POINT OF CONNECTION
PR	PAIR
PSI	POUNDS PER SQUARE INCH
PT	PLASTER TRAP
PVC	POLYVINYL CHLORIDE
PWR	POWER
QTY	QUANTITY
R	RISER
RA	RETURN AIR
RAD	RADIUS
RAD	RADIATOR
RCP	REFLECTED CEILING PLAN
RCP	REINFORCED CONCRETE PIPE
RCU	RECIPROCATING CHILLER UNIT
RD	ROOF DRAIN
RD	REFRIGERANT DISCHARGE
REF	REFERENCE
REFR	REFRIGERANT
REG	REGISTER
REM	REMOVABLE
REQ(D)	REQUIRE(D)
REV	REVISION(S)
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RH	REFLIEF HOOD
RHC	REHEAT COIL
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RM	ROOM
RND	ROUND
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
S	SMOKE DAMPER
S	SOUTH
S	SANITARY SEWER
S	SPRINKLER LINE
SA	SUPPLY AIR
SAN	SANITARY WASTE
SC	SECURITY
SCHED	SCHEDULE
SCW	SOFT COLD WATER
SD	SMOKE DAMPER
SD	STORM DRAIN
SD	SMOKE DETECTOR
SE	STEAM EXHAUST VENT
SECT	SECTION
SGL	SINGLE
SH	SHOWER
SHT	SHEET
SHW	SOFT HOT WATER
SIM	SIMILAR
SK	SINK
SM	SPRINKLER MAIN
SP	STATIC PRESSURE (H2O)
SP	STAND PIPE
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATION(S)
SPK	SPRINKLER
SQ	SQUARE
SS	STAINLESS STEEL
SS	SERVICE SINK
SST	SECONDARY STORM DRAINAGE
ST	STORM DRAINAGE
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SV	SOLENOID VALVE
SWBD	SWITCHBOARD
SWP	STEAM WORKING PRESSURE
SYM	SYMETRICAL
T	TEMPERED
T	THERMOSTAT
T&B	TOP AND BOTTOM
TA	TRANSFER AIR
TB	TERMINAL BOX
TC	TEMPERATURE CONTROL
TD	TRANSFER DUCT
TEMP	TERMPORARY
TEMP	TEMPERATURE
THK	THICK(NESS)
TMV	THERMOSTATIC MIXING VALVE
TOIL	TOILET
TPV	TRAP PRIMER
TS	TEMPERATURE SENSOR
TSP	TOTAL STATIC PRESSURE
TT	TEMPERATURE TRANSMITTER
TYP	TYPICAL
UC	UNIT COOLER
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
UTIL	UTILITY
UV	UNIT VENTILATOR
V	VOLT
V	VENT
V	VACUUM
VA	VOLT-AMPERE
VA	VALVE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VBF	VENT BELOW FLOOR
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VEL	VELOCITY
VENT	VENTALATOR(TION)
VERT	VERTICAL
VEST	VESTIBULE
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VP	VACUUM PUMP
VSMP	VARIABLE SPEED MOTOR CONTROLLER
VTR	VENT THROUGH ROOF
W	WIRE
W	WEST
W	WATER SERVICE
W	WIDE
W	WASTE (PLUG)
W	WATT
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WC	WATER CLOSET
WCC	WATER COOLED CONDENSER
WCL	WATER CLOSET/LAVATORY COMBINATION
WCO	WALL CLEAN OUT
WF	WASH FOUNTAIN
WFMD	WATER FLOW MEASURING DEVICE
WG	WIRE GUARD
WH	WALL HYDRANT
WH	WATER HEATER
WHA	WATER HAMMER ARRESTOR
WLR	WATER LOOP RETURN
WLS	WATER LOOP SUPPLY
WP	WEATHER-PROOF (NEMA 3R)
WP	WEATHERPROOF
WPB	WHIRLPOOL BATH
WSP	WET STAND PIPE
WT	WEIGHT
YH	YARD HYDRANT
ZCB	ZONE CONTROL BOX
ZCV	ZONE CONTROL VALVE

GENERAL NOTES

1. GENERAL NOTES APPLY TO ALL MECHANICAL AND PLUMBING DRAWINGS.
2. MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL 2" x 10" CONTINUOUS WOOD BLOCKING IN STUD PARTITIONS FOR ANCHORAGE OF WALL ATTACHED ITEMS, INCLUDING BUT NOT LIMITED TO, WALL MOUNTED FIXTURES.
3. MECHANICAL CONTRACTOR SHALL COORDINATE ALL MECHANICAL CHASE SIZES WITH GENERAL CONTRACTOR.
4. WALL OPENINGS FOR FIRE DAMPERS SHALL BE FRAMED PER THE FIRE DAMPER MANUFACTURER'S RECOMMENDATIONS. COORDINATE WITH GENERAL CONTRACTOR.
5. MECHANICAL CONTRACTOR SHALL COORDINATE SIZES AND LOCATIONS OF 4" HIGH CONCRETE HOUSEKEEPING PADS WITH THE MECHANICAL EQUIPMENT SUPPLIERS AND GENERAL CONTRACTOR.
6. MECHANICAL AND PLUMBING PLANS INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF PIPE, DUCTWORK, EQUIPMENT, SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMMATIC IN CHARACTER AND DOES NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING AND EXISTING CONDITION. LOCATION OF THESE ITEMS MAY BE ADJUSTED CONDITIONAL UPON THE SATISFACTORY COMPLIANT WITH ALL OTHER REQUIREMENTS (SEE NOTE 10 AND 15).
7. SEE SHEET CP1.0 AND CP1.1 FOR LOCATIONS OF FIRE RATED WALLS WHERE APPLICABLE.
8. ALL WALL PENETRATIONS AT RATED WALL LOCATIONS REQUIRED FOR PIPES, CONDUIT, DUCTWORK, ETC. SHALL BE SEALED TO STOP THE PASSAGE OF FIRE AND/OR SMOKE WITH FIRE SAFING AND APPROVED FIRESTOPPING SEALANT PER DETAILS XX/A10.X AND XX/A10.X BY THE GENERAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR ALL WALL PENETRATIONS FOR CORRECT SIZES.
9. MECHANICAL CONTRACTOR SHALL COORDINATE CUT-OUTS FOR CASEWORK, MILLWORK, OR OTHER EQUIPMENT AS REQUIRED WITH THE GENERAL CONTRACTOR.
10. ALL ASPECTS OF THE WORK AND ITEMS NOT SPECIFICALLY MENTIONED, BUT WHICH ARE NECESSARY TO MAKE A COMPLETE WORKING INSTALLATION, SHALL BE INCLUDED, AND INDICATED IN THE CONTRACTOR'S BID.
11. NO ASBESTOS OR PCB CONTAINING MATERIALS SHALL BE USED ON THIS PROJECT.
12. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS ARE RESPONSIBLE FOR PROPER REMOVAL AND DISPOSAL OF ALL DEBRIS GENERATED BY CONSTRUCTION OF THE PROJECT. THE REMOVAL AND DISPOSAL OF ALL CONSTRUCTION DEBRIS SHALL BE IN FULL COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. THE PREMISES SHALL BE KEPT CLEAN AND FREE FROM ALL WASTE MATERIALS.
13. GENERAL CONTRACTOR SHALL PROTECT NEW CONSTRUCTION FROM DAMAGE BY ALL TRADES. ALL SUCH DAMAGE CAUSED BY THE CONTRACTOR DURING THE COURSE OF THIS WORK SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
14. ALL CONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS AND FIELD CONDITIONS PRIOR TO ORDERING OR INSTALLING MATERIALS OR EQUIPMENT.
15. ALL MECHANICAL AND PLUMBING SYSTEMS SHALL BE CONCEALED WITHIN WALLS, UNDERGROUND, ABOVE CEILINGS OR IN A/E APPROVED UTILITY SPACES IN ALL CASES UNLESS SPECIFICALLY NOTE OTHERWISE ON THE DRAWINGS. EXPOSED ITEMS MUST BE LOCATED IN AREAS APPROVED BY THE A/E. EXPOSED ITEMS SHALL BE INSTALLED AND FINISHED TO PROVIDE MINIMAL VISUAL IMPACT. ALL EXPOSED ITEMS ARE TO BE PAINTED TO MATCH THE ADJACENT SURFACES UNLESS SCHEDULED FOR AN ACCENT COLOR.

REVIEW AND REVISE THESE NOTES TO MATCH PROJECT'S NEEDS

PLUMBING NOTATION

PIPES SIZES SHOWN ON THE DRAWINGS CAN BE FOLLOWED BY PIPE SIZING CRITERIA. THIS CRITERIA CAN EITHER BE SQUARE FOOTAGE (FOR STORM DRAIN PIPING), FIXTURE UNIT VALUES (FOR DOMESTIC WATER, SANITARY WASTE AND VENT PIPING), GALLONS PER MINUTE (FOR DOMESTIC HOT WATER RECIRCULATION PIPING), OR IN THOUSANDS OF BTUH (MBH, FOR NATURAL GAS PIPING). THE FOLLOWING LEGEND WILL AID IN UNDERSTANDING THE DRAWINGS.

FOR EXAMPLE:

1. 12" SD (32,000 SF): THIS IS A 12" STORM DRAIN PIPE CARRYING 32,000 SQUARE FEET OF ROOF AREA.
2. 3" CW (200 FU): THIS IS A 3" DOMESTIC COLD WATER PIPE CARRYING 200 FIXTURE UNITS OF COLD WATER.
3. 2" 110-HW (50 FU): THIS IS A 2" DOMESTIC HOT WATER PIPE CARRYING 50 FIXTURE UNITS OF 110° HOT WATER.
4. 1" 140-HWC (5.0 GPM): THIS IS A 1" DOMESTIC HOT WATER RECIRCULATION PIPE CARRYING 5.0 GALLONS PER MINUTE OF 140° HOT WATER.
5. 4" W (150 FU): THIS IS A 4" SANITARY WASTE PIPE CARRYING 150 FIXTURE UNITS OF WASTE WATER.
6. 2" V (20 FU): THIS IS A 2" SANITARY VENT PIPE CARRYING 20 FIXTURE UNITS OF VENT GAS.
7. 1-1/4" G (600 MBH): THIS IS A 1-1/4" NATURAL GAS PIPE CARRYING 600,000 BTUH.

SYMBOLS

HVAC

- DIFFUSER (SUPPLY)
- GRILLE (RETURN OR EXHAUST)
- WALL REGISTER
- SLOT DIFFUSER
- SUPPLY ARROW
- RETURN ARROW
- EXHAUST ARROW
- D-1 12"x12" 200 CFM — RECTANGULAR DIFFUSER INDICATION SHOWING CFM
- D-1 12 Ø 200 CFM — ROUND DIFFUSER INDICATION SHOWING CFM
- G-1 12"x12" 200 CFM — RECTANGULAR GRILLE INDICATION SHOWING CFM
- R-1 12"x12" 200 CFM — RECTANGULAR REGISTER INDICATION SHOWING CFM
- F — FIRE DAMPER
- S — SMOKE DAMPER
- FS — FIRE/SMOKE DAMPER
- BD — BACKDRAFT DAMPER
- GD — GRAVITY DAMPER
- RD — BAROMETRIC RELIEF DAMPER
- PR — PRESSURE REDUCING DAMPER
- M — MOTORIZED DAMPER
- VD — VOLUME DAMPER
- VOLUME DAMPER
- OPPOSED BLADE DAMPER
- PARALLEL BLADE DAMPER
- T — THERMOSTAT - WALL MOUNTED
- T — THERMOSTAT - CEILING MOUNTED
- C_O — CARBON MONOXIDE SENSOR - WALL MOUNTED
- C_O — CARBON MONOXIDE SENSOR - CEILING MOUNTED
- C_{O2} — CARBON DIOXIDE SENSOR - WALL MOUNTED
- C_{O2} — CARBON DIOXIDE SENSOR - CEILING MOUNTED
- H — HUMIDISTAT - WALL MOUNTED
- H — HUMIDISTAT - CEILING MOUNTED
- S — TEMPERATURE SENSOR - WALL MOUNTED
- S — TEMPERATURE SENSOR - CEILING MOUNTED
- N_{O2} — NITROGEN DIOXIDE SENSOR - WALL MOUNTED
- N_{O2} — NITROGEN DIOXIDE SENSOR - CEILING MOUNTED
- P — PRESSURE SENSOR - WALL MOUNTED
- P — PRESSURE SENSOR - CEILING MOUNTED
- 24"x12" — TYPICAL DUCT - SIZE AS INDICATED (WIDTH x DEPTH) SIZE INDICATED FREE AREA
- MITERED ELBOW WITH VANES
- MITERED ELBOW WITHOUT VANES
- RADIUS ELBOW
- TEE WITH VANES
- RADIUS TEE
- ROUND DUCT UP
- SUPPLY DUCT UP
- RETURN DUCT UP
- EXHAUST DUCT UP
- ROUND DUCT DOWN
- SUPPLY DUCT DOWN
- RETURN DUCT DOWN
- EXHAUST DUCT DOWN
- DUCT SMOKE DETECTOR
- FLEXIBLE DUCT CONNECTION
- TRANSFER DUCT
- SA — SUPPLY AIR - SINGLE LINE
- RA — RETURN AIR - SINGLE LINE
- EA — EXHAUST AIR - SINGLE LINE
- OA — OUTSIDE AIR - SINGLE LINE
- TA — TRANSFER AIR - SINGLE LINE
- LTD — LINED TRANSFER DUCT - SINGLE LINE
- SINGLE LINE REDUCER
- SINGLE LINE FLEX DUCT
- AFMS — AIRFLOW MEASUREMENT STATION
- DP — DIFFERENTIAL PRESSURE SENSOR (DUCT MOUNTED)
- SP — STATIC PRESSURE SENSOR (DUCT MOUNTED)
- SECURITY BAR
- NEW TO EXISTING CONNECTION POINT

PIPING - HEATING

HWS	LOW TEMPERATURE HOT WATER SUPPLY
HWR	LOW TEMPERATURE HOT WATER RETURN
HTWS	HIGH TEMPERATURE HOT WATER SUPPLY
HTWR	HIGH TEMPERATURE HOT WATER RETURN
MHWS	MEDIUM TEMPERATURE HOT WATER SUPPLY
MHWR	MEDIUM TEMPERATURE HOT WATER RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LPR	LOW PRESSURE STEAM RETURN
HPS	HIGH PRESSURE STEAM SUPPLY
HPR	HIGH PRESSURE STEAM RETURN
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOV	FUEL OIL VENT

PIPING - A/C & REFR

CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
HCS	HOT/CHILLED WATER SUPPLY
HCR	HOT/CHILLED WATER RETURN
CS	CONDENSER WATER SUPPLY
CR	CONDENSER WATER RETURN
WLS	WATER LOOP SUPPLY
WLR	WATER LOOP RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RHG	REFRIGERANT HOT GAS
RD	REFRIGERANT DISCHARGE
CD	CONDENSATE DRAIN

PLUMBING

CW	DOMESTIC COLD WATER OR DOMESTIC COLD WATER
110 HW	110°F DOMESTIC HOT WATER
140 HW	140°F DOMESTIC HOT WATER
	DOMESTIC HOT WATER (GENERIC)
110 HWC	110°F DOMESTIC HOT WATER RECIRCULATING
140 HWC	140°F DOMESTIC HOT WATER RECIRCULATING
	DOMESTIC HOT WATER RECIRC (GENERIC)
SD	STORM DRAIN ABOVE FLOOR
SD	STORM DRAIN BELOW FLOOR
OSD	OVERFLOW STORM DRAIN ABOVE FLOOR
OSD	OVERFLOW STORM DRAIN BELOW FLOOR
W	SANITARY WASTE ABOVE FLOOR
W	SANITARY WASTE BELOW FLOOR
V	VENT
VBF	VENT BELOW FLOOR
AW	ACID WASTE ABOVE FLOOR
AW	ACID WASTE BELOW FLOOR
AV	ACID VENT
G	NATURAL GAS
SCW	SOFT COLD WATER
SHW	SOFT HOT WATER
T	TEMPERED WATER
DI	DISTILLED WATER
DE	DEIONIZED WATER
CD	CONDENSATE DRAIN
VAC	VACUUM
LV	LABORATORY VACUUM
MV	MEDICAL VACUUM
N	NITROGEN
CO2	CARBON DIOXIDE
N2O	NITROUS OXIDE
O2	OXYGEN
LOX	LIQUID OXYGEN
A	COMPRESSED AIR
LA	LABORATORY COMPRESSED AIR
MA	MEDICAL COMPRESSED AIR
LS	LAWN SPRINKLER

VALVES AND FITTINGS

- CO — CLEAN OUT
- WCO — WALL CLEAN OUT
- FCO — FLOOR CLEAN OUT
- GCO — GRADE CLEAN OUT (DOUBLE CLEAN OUT)
- FLOOR DRAIN / FLOOR SINK
- ROOF DRAIN / OVERFLOW DRAIN
- XX — RISER ID
- DOWNSPOUT NOZZLE
- WALL HYDRANT
- HOSE BIB
- ALIGNMENT GUIDE
- PIPE ANCHOR
- EXPANSION JOINT
- PIPE CAP
- PIPE UP
- PIPE DOWN
- PIPE TEE UP
- PIPE TEE DOWN
- UNION
- DIRECTION OF PIPE PITCH
- AQUASTAT
- X — WATER HAMMER ARRESTER
- A_E — ANESTHESIA EVACUATOR
- A — MEDICAL COMPRESSED AIR OUTLET
- D — DEIONIZED WATER OUTLET
- D_S — DISTILLED WATER OUTLET
- G — NATURAL GAS OUTLET
- N — NITROGEN OUTLET
- N_O — NITROUS OXIDE OUTLET
- OXYGEN OUTLET
- V — VACUUM INLET
- NEW TO EXISTING CONNECTION POINT
- EXPANSION LOOP
- BALANCING VALVE
- BALANCING VALVE W/ METERING POINTS
- BALL VALVE
- BUTTERFLY VALVE
- V — VALVE (GENERIC)
- CHECK VALVE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- STEAM TRAP
- FLEXIBLE CONNECTION
- FLOW DIRECTION
- GATE VALVE
- GLOBE VALVE
- MANUAL AIR VENT
- AUTOMATIC AIR VENT
- PLUG VALVE
- PRESSURE GAUGE
- SOLENOID VALVE
- ANGLE VALVE
- AUTOMATIC CONTROL VALVE 2-WAY
- AUTOMATIC CONTROL VALVE 3-WAY
- AUTOMATIC FLOW CONTROL VALVE
- STRAINER
- PT — PRESSURE AND TEMPERATURE TEST PORT
- THERMOMETER
- PUMP (GENERIC)
- PRESSURE REDUCING VALVE (WATER SYSTEMS) PRESSURE REGULATING VALVE (GAS SYSTEMS)
- RELIEF VALVE
- FLOW MEASURING DEVICE
- BACKFLOW PREVENTER

FIRE PROTECTION

- F — FIRE PROTECTION WATER SUPPLY
- SM — SPRINKLER MAIN
- ALARM VALVE, WET
- ALARM VALVE, DRY
- FIRE PROTECTION RISER
- FIRE DEPARTMENT CONNECTION
- SPRINKLER HEAD, PENDANT
- SPRINKLER HEAD, UPRIGHT
- SPRINKLER HEAD, SIDE WALL
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- OS&Y VALVE
- OS&Y VALVE (INDICATING)

GENERAL SYMBOLS

- ? / ??? SIM — DETAIL NUMBER; CROSS REFERENCE; SHEET NUMBER; SIMILAR OR TYPICAL REFERENCE
- ? / ??? SIM — WALL SECTION
- ? / ??? SIM — DETAIL REFERENCE
- SIM ? / ??? — ? / ??? SIM — BUILDING SECTION
- ? East ? — BUILDING ELEVATION INTERIOR ELEVATION
- XX/ A11.X — CASEWORK ELEVATION
- ? — KEYNOTE
- ? — COLUMN GRID LINE
- ROOM NAME ??? — ROOM NUMBER/NAME
- ? — DOOR NUMBER / INTERIOR WINDOW
- 1t — EXTERIOR WINDOW NUMBER
- ? — WALL TYPE
- DESCRIPTION — REVISION NUMBER
- EARTH
- GRAVEL
- SAND
- CONCRETE
- PRECAST CONCRETE
- STEEL
- GYM FLOOR
- WOOD (CONTINUOUS BLOCKING)
- WOOD (NON-CONTINUOUS BLOCKING)
- WOOD (TRIM/FINISH)
- GLASS
- STONE
- SHINGLES
- CONCRETE MASONRY UNIT
- BRICK VENEER
- STEEL (LARGE SCALE)
- PLYWOOD (LARGE SCALE)
- GYPSUM WALL BOARD
- BATT INSULATION
- RIGID INSULATION
- SPRAY FOAM INSULATION
- FIRE SAFING INSULATION
- PROTECTION BOARD
- CARPET (LARGE SCALE)
- ACOUSTIC TILE (LARGE SCALE)
- TILE (LARGE SCALE)

DLR Group

- NOT FOR CONSTRUCTION -

SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

100% DESIGN DEVELOPMENT

09-25-19

Revisions

11-16116-20

MECHANICAL SYMBOLS AND ABBREVIATIONS

M0.1

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HVAC PLAN, FIRST LEVEL - AREA B

NORTH

SCALE: 1/8" = 1'-0"

LEGEND NOTES

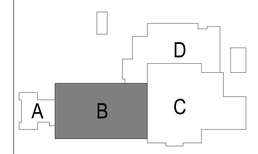
HVAC GENERAL NOTES

ADD GENERAL NOTES THAT ARE PLACED ON EVERY HVAC PLAN

KEYED NOTES

Key Value	Keynote Text

KEY PLAN



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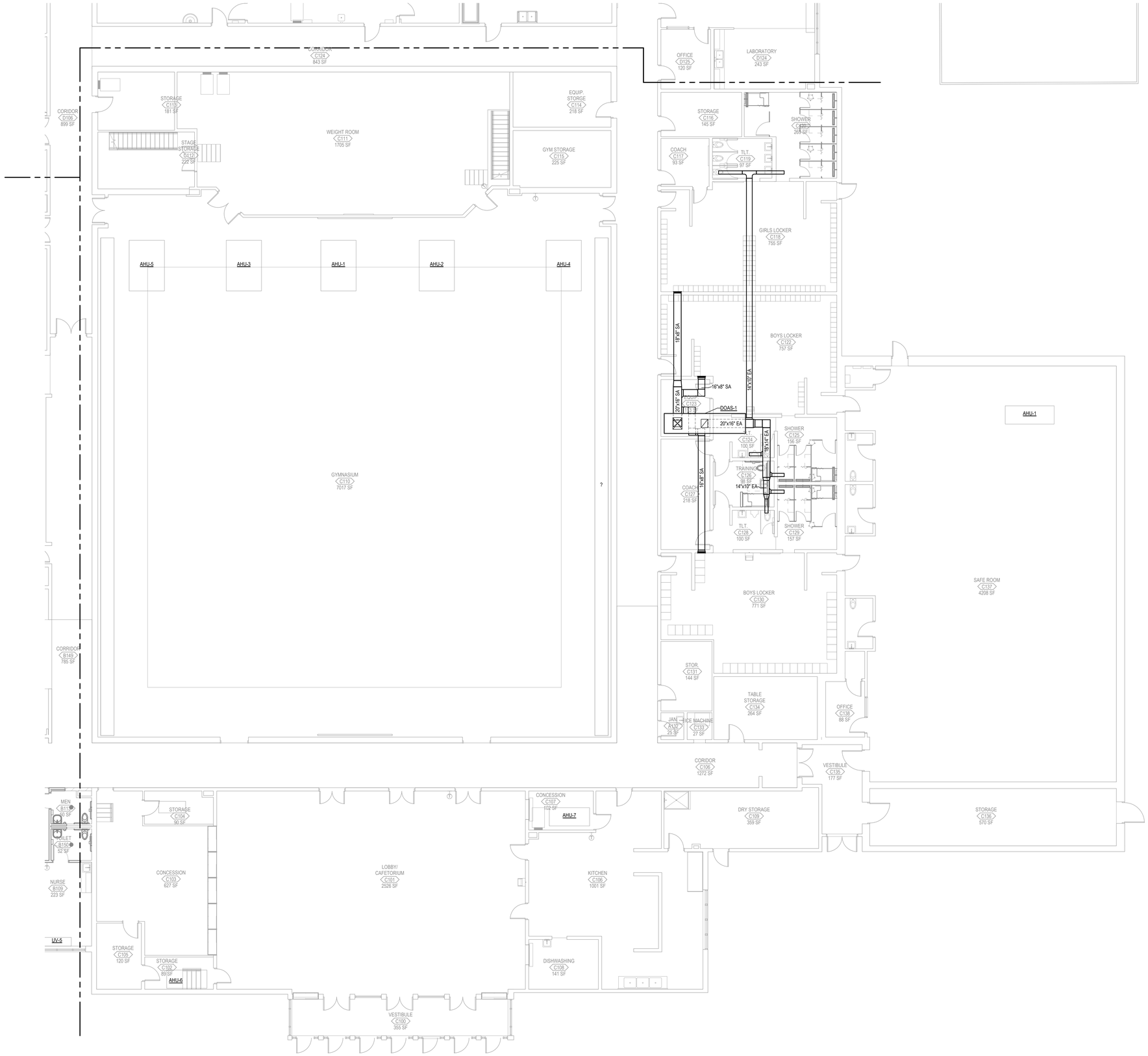
HVAC PLAN, FIRST LEVEL - AREA B

M1.1B



HVAC PLAN, FIRST LEVEL - AREA C

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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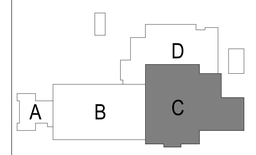
KEY PLAN



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HVAC PLAN, FIRST LEVEL - AREA C

M1.1C

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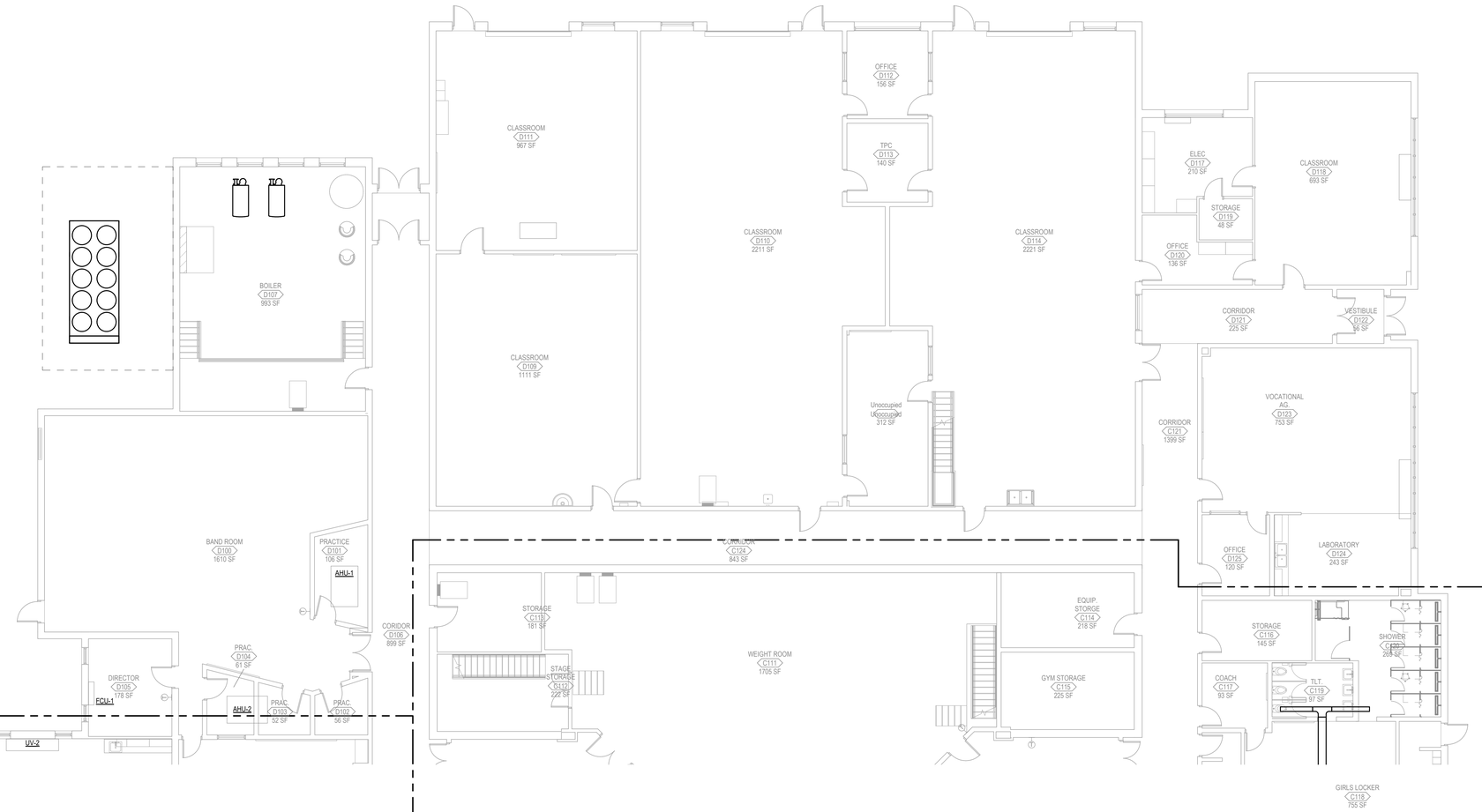
LEGEND NOTES



HVAC PLAN, FIRST LEVEL - AREA D

SCALE: 1/8" = 1'-0"

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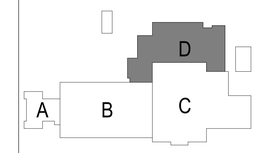
KEY PLAN



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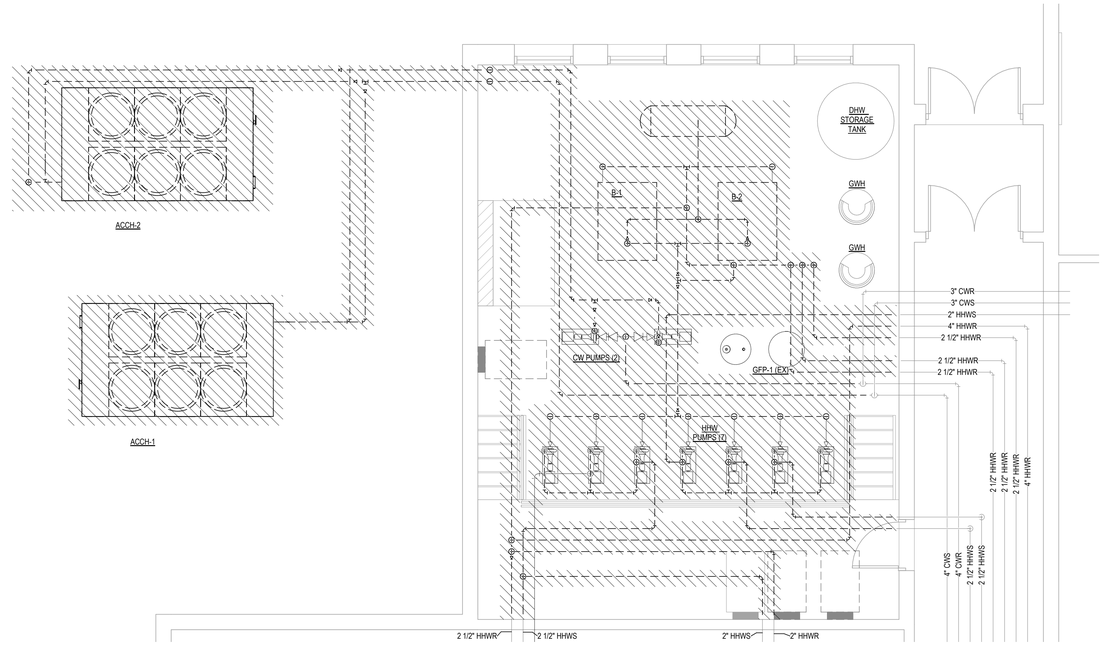
HVAC PLAN, FIRST LEVEL - AREA D

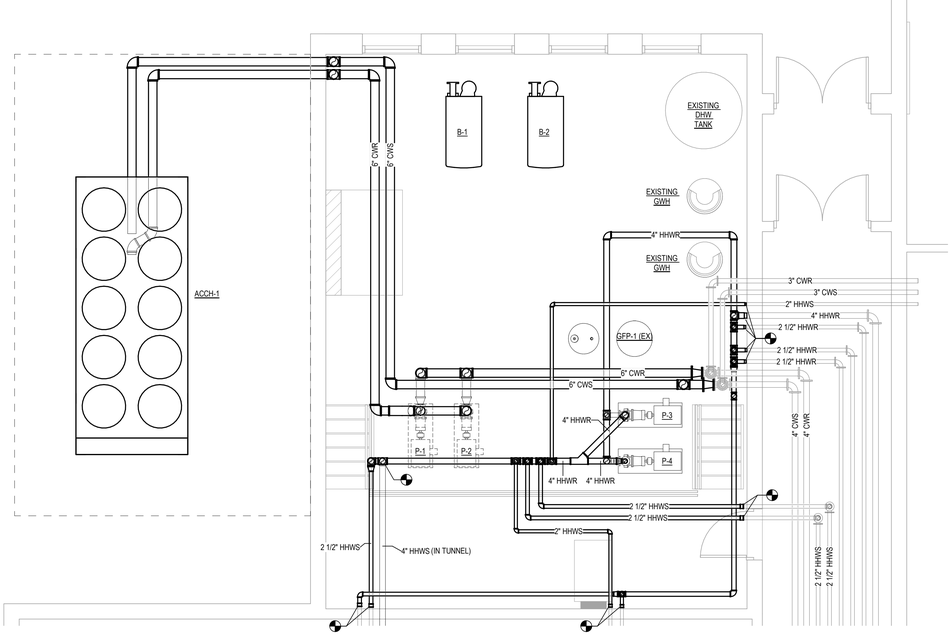
M1.1D



NORTH

ENLARGED MECHANICAL ROOM PLAN - DEMOLITION WORK

SCALE: 1/4" = 1'-0"



NORTH

ENLARGED MECHANICAL ROOM PLAN - NEW WORK

SCALE: 1/4" = 1'-0"

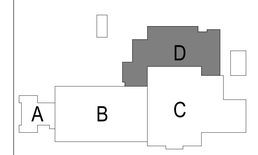
HVAC PLEGEND NOTESES

ADD GENERAL NOTES THAT ARE PLACED ON EVERY HVAC PIPING PLAN

KEYED NOTES

Key Value	Keynote Text

KEY PLAN



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ENLARGED HVAC PLANS

M3.1

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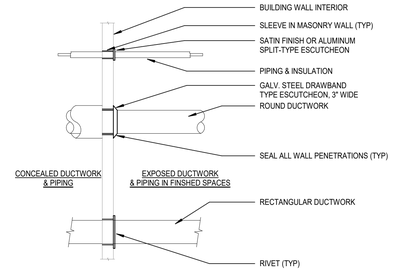
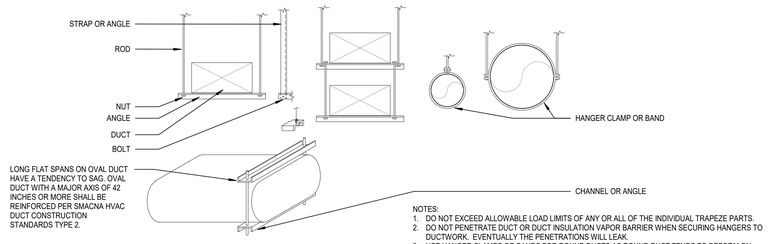


1 M4.1 DUCT/PIPE WALL PENETRATIONS

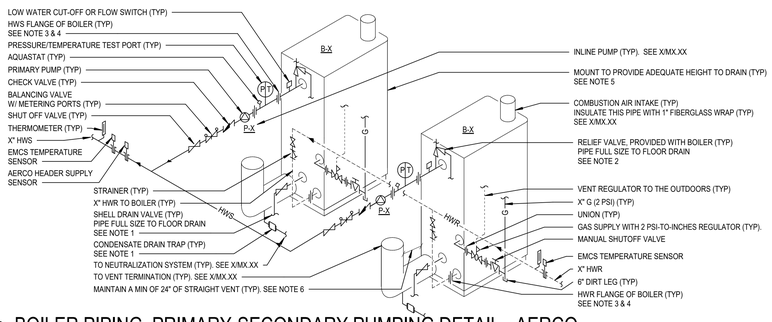
NO SCALE



NOTES:
1. DO NOT EXCEED ALLOWABLE LOAD LIMITS OF ANY OR ALL OF THE INDIVIDUAL TRAPEZE PARTS.
2. DO NOT PENETRATE DUCT OR DUCT INSULATION VAPOR BARRIER WHEN SECURING HANGERS TO DUCTWORK. EVENTUALLY THE PENETRATIONS WILL LEAK.
3. USE HANGER CLAMPS OR BANDS FOR ROUND DUCTS AS ROUND DUCT TENDS TO DEFORM ON TRAPEZE HANGERS.
4. TEARS, PUNCTURES, ETC. SHALL BE REPAIRED WITH TAPE OR MASTIC TO MAINAIN THE INTEGRITY OF THE VAPOR BARRIER.
5. DO NOT USE ANY STRAP HANGERS WITH SCREWS ON ANY DUCTWORK THAT IS EXTERNALY WRAPPED.

2 M4.1 DUCTWORK HANGING DETAIL

NO SCALE

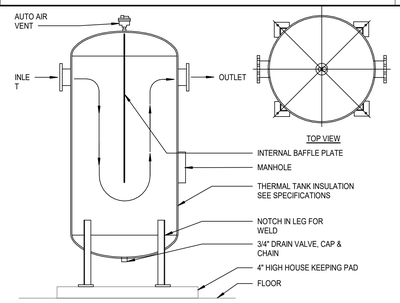


DETAIL NOTES:
1. SHELL DRAIN VALVE AND CONDENSATE DRAIN TRAP SHOULD BE ARRANGED TO PERMIT THE FLUIDS TO DRAIN FREELY, BY GRAVITY, TO CONVENIENT FLOOR DRAIN.
2. RELIEF VALVE SHOULD BE PIPED VERTICALLY TO SPILL OVER A FLOOR DRAIN.
3. LOCATE WATER INLET AND OUTLET FITTINGS (IE UNIONS, ELBOWS, ETC.) A MINIMUM OF 6" FROM BOILER FITTINGS TO PREVENT INTERFERENCE WITH REMOVAL OF BOILER PANELS AND COVERS.
4. ALL PIPING AND ELECTRIC CONNECTIONS (SERVICE SWITCHES, CONDUIT BOXES) SHOULD BE LOCATED A MINIMUM OF 6" AWAY FROM SIDE PANELS.
5. COORDINATE BOILER PAD HEIGHT WITH BOILER CONDENSATE NEUTRALIZATION TANK INSTALLATION SO PROPER PAD HEIGHT IS INSTALLED. SEE BOILER CONDENSATE NEUTRALIZATION TANK DETAIL FOR ADDITIONAL INFORMATION.
6. THERE SHALL BE A MINIMUM OF 24" OF STRAIGHT "VENT STARTER" AT THE BOILER OUTLET CONNECTION PRIOR TO INSTALLATION OF ANY VERTICAL GAS VENT DUCTWORK.

NOTES TO DESIGNER:
1. THIS IS FIRST IN AND FIRST OUT PIPING CONFIGURATION WITH PRIMARY BOILER PUMPS.
2. VERIFY GAS PRESSURE. IF 4" W.C. TO 14" W.C., NO PRESSURE REGULATOR IS REQUIRED. DELETE REGULATOR AND VENT PIPING.
3. EDIT TEXT IN RED AND TURN TO BLACK TEXT.

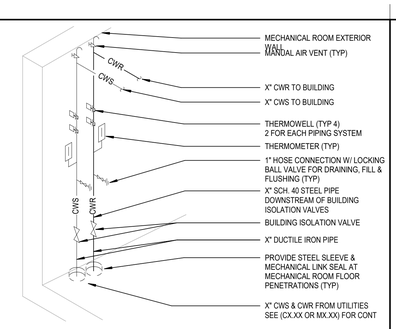
3 M4.1 BUFFER TANK - CHILLED WATER DETAIL

NO SCALE



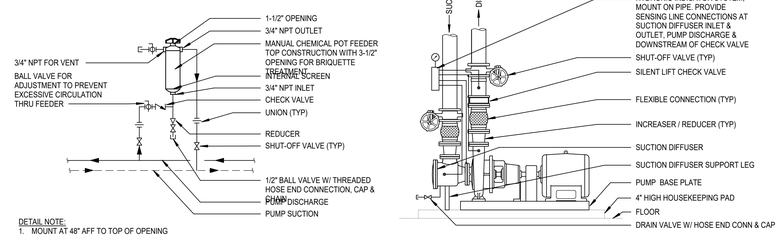
4 M4.1 CHILLED WATER ENTRANCE DETAIL

NO SCALE

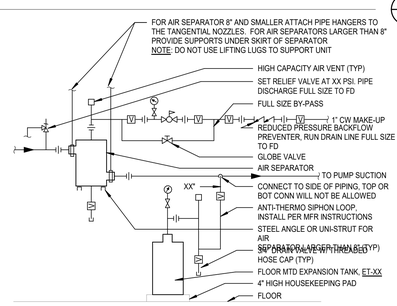


5 M4.1 BOILER PIPING, PRIMARY-SECONDARY PUMPING DETAIL - AERCO

NO SCALE

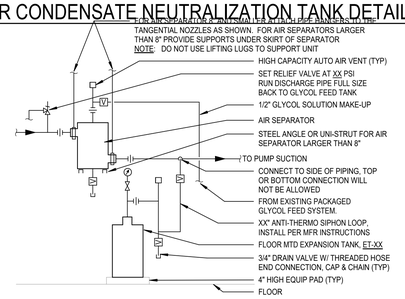


DETAIL NOTE:
1. MOUNT AT 48" AFF TO TOP OF OPENING



6 M4.1 BOILER CONDENSATE NEUTRALIZATION TANK DETAIL

NO SCALE



7 M4.1 CHEMICAL POT FEEDER DETAIL

NO SCALE

8 M4.1 END SUCTION PUMP DETAIL

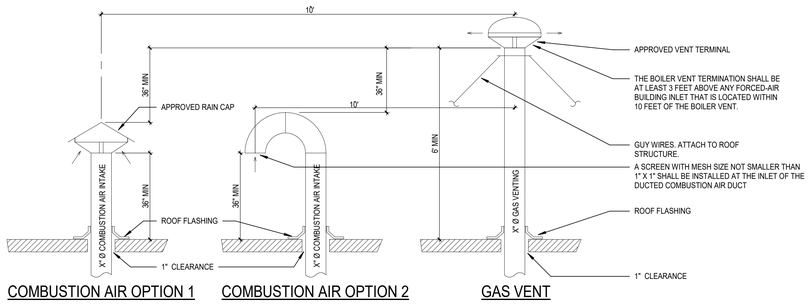
NO SCALE

9 M4.1 WATER MAKE-UP & AIR CONTROL PIPING DETAIL

NO SCALE

10 M4.1 WATER MAKE-UP & AIR CONTROL DETAIL - GLYCOL

NO SCALE



COMBUSTION AIR OPTION 1 | COMBUSTION AIR OPTION 2 | GAS VENT

NOTE:
INTAKE
THE BOILER AIR INTAKE SHALL BE LOCATED AT LEAST 3 FEET BELOW ANY VENT TERMINATION WITHIN 10 FEET.
INSTALL LARGE-MESH SCREENS TO PROTECT AGAINST THE ENTRY OF FOREIGN OBJECTS BUT THE 'FREE AREA' SHALL BE AT LEAST TWICE THE FLUE CROSS-SECTIONAL AREA.

VENT
VENT VERTICAL DISCHARGE SHALL EXTEND AT LEAST 3 FEET ABOVE THE ROOF THROUGH PROPERLY FLASHED PENETRATIONS, AND AT LEAST 2 FEET ABOVE ANY OBJECT WITHIN A 10-FOOT HORIZONTAL DISTANCE.

11 M4.1 COND BOILER / WATER HTR COMBUSTION AIR INTAKE & GAS VENT

NO SCALE

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SHENANDOAH COMMUNITY SCHOOL DISTRICT

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MECHANICAL DETAILS

M4.1

AIR HANDLING UNIT WITH INTEGRAL AIR-TO-AIR ENERGY RECOVERY UNIT SCHEDULE

			ENERGY RECOVERY PLATE SECTION							HEATING MODE						DX COOLING MODE				HOT GAS...			SUPPLY FAN(S)			EXHAUST FAN(S)			ELECTRICAL									
					WINTER HEAT RECOVERY			SUMMER HEAT RECOVERY							GAS PRESSURE (IN. WG)																						
MARK (AHU-X)	LOCATION	SERVES	O.A. CFM	E.A. CFM	OA EAT DB (DEG. F)	RA EAT DB / WB (DEG. F)	LAT DB / WB (DEG. F)	OA EAT DB / WB (DEG. F)	RA EAT DB / WB (DEG. F)	LAT DB / WB (DEG. F)	EAT DB (DEG. F)	LAT DB (DEG. F)	FUEL	INPUT (MBH)	OUTPUT	MIN	MAX	EAT DB / WB (DEG. F)	LAT DB / WB (DEG. F)	TOTAL CAP (MBH)	SENS CAP (MBH)	EAT DB / WB (DEG. F)	LAT DB (DEG. F)	TOTAL CAP (MBH)	CFM	ESP (IN WG)	MOTOR QTY & HP	CFM	ESP (IN WG)	MOTOR QTY & HP	V	PH	Hz	FLA	MCA	MOP	REFRIG	UNIT WEIGHT (LBS)	CONDENSATE DRAIN SIZE (INCHES)	BASIS OF DESIGN	MECH NOTES
DOAS-1	C123	VENTILATION	2200	2,400	-10	72 / 55.9	42.4 / 29.4	95 / 78	75 / 62.5	82.2 / 74.7	42.4	109.5	NG	200	160	6	14	82.2 / 74.7	58.0 / 57.9	135.5	58.9	58.0 / 57.9	70	36.4	2,200	1.0	1 @ 2	2,400	1.0	1 @ 1.5	208	3	60		60.8	90	R410-A	3130	1.25	VALENT VPRP-110-10C-20I	1 THRU 5

MECHANICAL NOTES:

1. PROVIDE ONE POINT POWER CONNECTION. PROVIDE FACTORY MOUNTED FUSED DISCONNECT SWITCH.
2. ENERGY RECOVERY PLATE SHALL BE ARI 1060-2005 CERTIFIED FOR THERMAL PERFORMANCE.
3. UNITS SHALL FIT WITHIN THE DIMENSIONS OF THE SPECIFIED UNITS AS SHOWN ON THE DRAWINGS, WITH THE SAME DISCHARGE/RETURN ARRANGMENTS. SERVICE SHALL BE FROM THE SAME SIDE(S) AS SHOWN ON THE PLANS.

BOILER - HOT WATER - VERTICAL FIRE TUBE SCHEDULE

		OUTPUT		WATER DATA				WORKING	ELEC DATA				WEIGHT	AIR	EXHAUST		MECH
MARK (B-X)	INPUT (MBH)	(MIN)	(MAX)	GPM	PD (FT WG)	EWT (°F)	LWT (°F)	PRESSURE (PSIG)	V	PH	HZ	FLA	OPERATING (LBS)	INLET (IN)	OUTLET (IN)	BASIS OF DESIGN	NOTES
B-1	3000	2610	2880	70	3	60	140	160	208	3	60	5	2580	8	8	Aerco Benchmark BMK 3000	1 thru 7
B-2	3000	2610	2880	70	3	60	140	160	208	3	60	5	2580	8	8	Aerco Benchmark BMK 3000	1 thru 7

MECHANICAL NOTES:

1. BOILER WATER VOLUME IS 55 GALLONS.
2. BOILER MANAGEMENT SYSTEM (BMS): THE BOILER MANUFACTURER SHALL SUPPLY AS PART OF THE BOILER PACKAGE A COMPLETELY INTEGRATED BOILER MANAGEMENT SYSTEM. THE BOILER MANAGEMENT SYSTEM SHALL BE COMPRISED OF A MICROPROCESSOR BASED CONTROL UTILIZING AN RS-485 INTERFACE BETWEEN THE BMS AND THE BOILERS.
3. FM COMPLIANT NATURAL GAS TRAIN RATED FOR 4" W.C. (MIN) TO 14" W.C. (MAX) GAS PRESSURE, WITH 15:1 TURNDOWN RATIO.
4. BOILER MINIMUM /MAXIMUM WATER FLOW = 25 GPM / 350 GPM. BOILER PRESSURE DROP AT 261 GPM = 6.93 FT WAT.

PUMP SCHEDULE

				PUMP	MIN	MOTOR DATA							MECH
MARK	SERVES	PUMP TYPE	GPM	HEAD (FT WG)	EFF (%)	HP (WATTS)	V	PH	HZ	RPM	SUCTION DIFFUSER	BASIS OF DESIGN	NOTES
P-1	CHILLED WATER	END SUCTION	400	150	75	25	208	3	60	1750	HG-3X	TACO FI	1,2,3
P-2	CHILLED WATER	END SUCTION	400	150	75	25	208	3	60	1750	HG-3X	TACO FI	1,2,3
P-3	HEATING HOT WATER	END SUCTION	200	100	75	15	208	3	60	1750	---	TACO FI	1,3
P-4	HEATING HOT WATER	END SUCTION	200	100	75	15	208	3	60	1750	---	TACO FI	1,3
P-7	BOILER B-1	IN-LINE PUMP	70	20	70	3/4	208	3	60	1750	---	TACO KV	
P-8	BOILER B-2	IN-LINE PUMP	70	20	70	3/4	208	3	60	1750	---	TACO KV	

MECHANICAL NOTES:

1. SHAFT GROUNDING: ON EACH VFD DRIVEN AC MOTOR, PROVIDE A MAINTENANCE FREE, CIRCUMFERENTIAL, CONDUCTIVE MICRO FIBER SHAFT GROUNDING RING TO DISCHARGE THE CURRENT(S) TO GROUND. PROVIDE AEGIS SGR BEARING PROTECTION RING OR EQUAL.
2. PUMP HEAD AND HORSEPOWER AS SHOWN INCLUDES CORRECTION FOR A 30% PROPYLENE GLYCOL / 70% WATER SOLUTION.
3. PUMP SHALL HAVE A MINIMUM SCCR OF 18kA

CHILLER - AIR COOLED SCHEDULE

		CHILLED WATER DATA					COMPRESSOR DATA			CONDENSER DATA			ELECTRICAL DATA						
MARK (ACCH-X)	MIN CAP (TON)	GPM	EWT (°F)	LWT (°F)	MAX PD (FT WC)	MIN EER (MBH/KW)	NO	TOTAL STEPS	REFR TYPE	FAN NO	FAN HP	AMB TEMP (°F)	V	PH	Hz	MCA	MAX OVERCURRENT PROTECTION AMPS	BASIS OF DESIGN	MECH NOTES
ACCH-1	200		55	45									120	1	60	50	55	DAIKIN PATHFINDER	1 THRU 7

MECHANICAL NOTES:

1. CHILLER SHALL PROVIDE AT LEAST THE MINIMUM CAPACITY SHOWN AT THE SCHEDULED ENTERING AND LEAVING CONDITIONS. NO EXCEPTIONS SHALL BE TAKEN TO THE PERFORMANCE DATA BY OTHER MANUFACTURERS.
2. FOULING FACTOR = .0001 HR-SQ FT-DEG F.
3. PROVIDE BUILDING AUTOMATION SYSTEM COMMUNICATION INTERFACE TO PERMIT REMOTE CHILLED WATER SETPOINT AND DEMAND LIMITING BY ACCEPTING A 4-20 MA OR 2-10 VDC ANALOG SIGNAL.
4. COIL PROTECTION: PROVIDE LOUVERED PANELS TO PROTECT THE CONDENSER COILS ONLY.
5. ACCESS PROTECTION: PROVIDE PROTECTION OF ACCESS AREA UNDERNEATH THE CONDENSER COILS BY GALVANIZED 4" BY 4" WELDED WIRE MESH.
6. CAPACITY AND PRESSURE DROP HAVE BEEN CORRECTED FOR A 30% PROPYLENE GLYCOL AND 70% WATER SOLUTION.
7. WHERE THE MANUFACTURER'S SERVICE CLEARANCES CANNOT BE MET, THE AMBIENT AIR TEMPERTURE SHALL BE INCREASED BY 5 DEGREES F MINIMUM.

FAN SCHEDULE

		FAN DATA				ELECTRICAL DATA								UNIT		MECH
MARK	SERVES	FAN TYPE	CFM	ESP (IN WG)	FAN RPM	DRIVE TYPE	HP	V	PH	HZ	MAX SONES	DAMPER	WEIGHT (LBS)	BASIS OF DESIGN	NOTES
EF-1	CHEM SCIENCE	CENT	880	0.3	1050	DIRECT	1/4	120	1	60	5.8	BD-20	30	COOK 120C13D	1 THRU 4
EF-2	BIO SCIENCE	CENT	1100	0.3	925	DIRECT	1/2	120	1	60	5.7	BD-20	39	COOK 135C13D	1 THRU 4

MECHANICAL NOTES:

1. FAN SELECTION SHALL NOT OPERATE IN MOTOR SAFETY FACTOR.
2. PROVIDE WITH SOLID STATE SPEED CONTROLLER, FACTORY INSTALLED AND PREWIRED.
3. PROVIDE DISCONNECT SWITCH IN NEMA-1 ENCLOSURE FACTORY MOUNTED AND WIRED.
4. FAN SHALL BE INTERLOCKED WITH WALL SWITCH. WALL SWITCH AND FAN POWER WIRING BY ELECTRICAL CONTRACTOR.

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MECHANICAL SCHEDULES

M5.1

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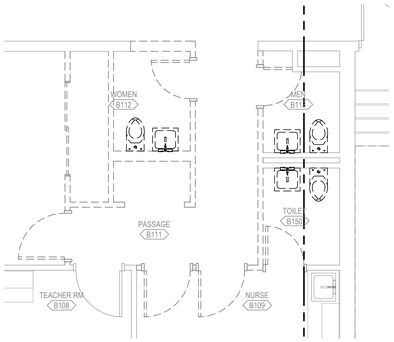
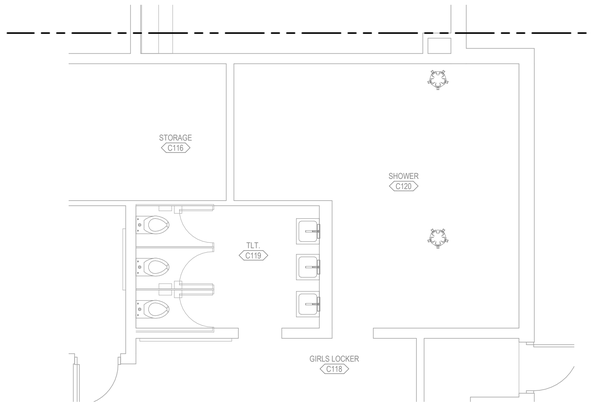
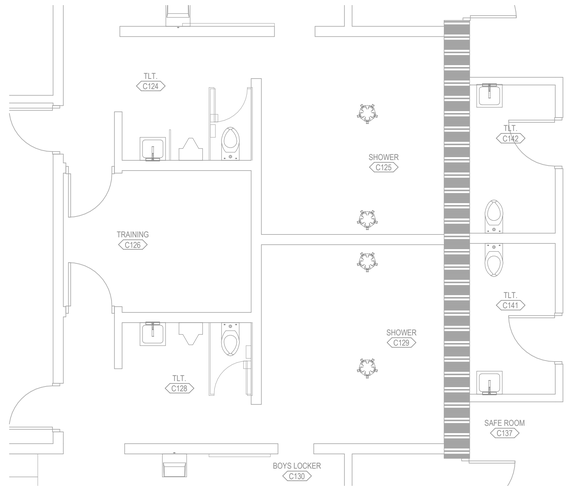


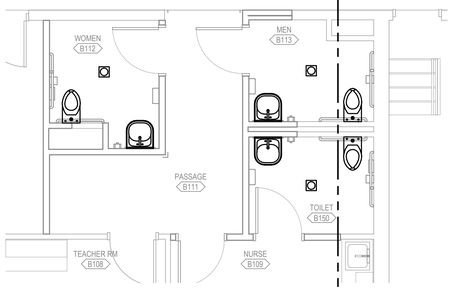
STAFF RESTROOMS - DEMOLITION
SCALE: 1/4" = 1'-0"



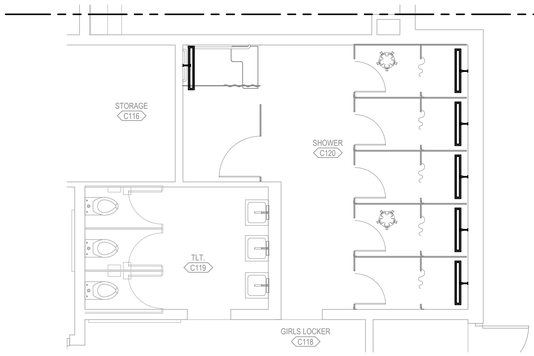
GIRLS SHOWERS - DEMOLTION
SCALE: 1/4" = 1'-0"



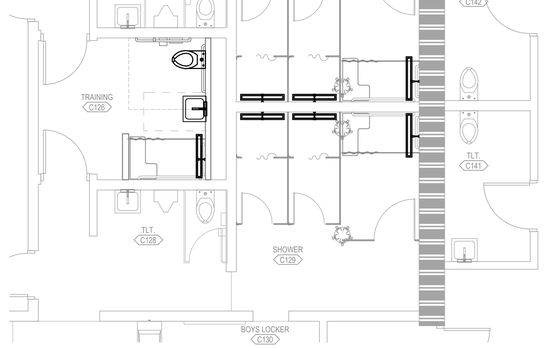
BOYS SHOWERS - DEMOLITION
SCALE: 1/4" = 1'-0"



STAFF RESTROOMS - NEW WORK
SCALE: 1/4" = 1'-0"



GIRLS SHOWERS - NEW WORK
SCALE: 1/4" = 1'-0"



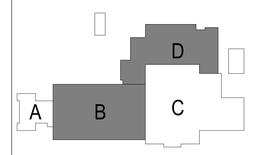
BOYS SHOWERS - NEW WORK
SCALE: 1/4" = 1'-0"

PLUMBI**LEGEND NOTES**,
ADD GENERAL NOTES THAT ARE PLACED ON EVERY PLUMBING PLAN

KEYED NOTES

Key Value	Keynote Text

KEY PLAN



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LARGE SCALE PLUMBING PLANS

P2.1

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ABBREVIATIONS

Ø	PHASE
A AMP	AMPERE
AC	ABOVE COUNTER
AF	AMP FRAME (CIRCUIT BREAKER)
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
AP	WIRELESS ACCESS POINT
AT	AMP TRIP (CIRCUIT BREAKER OR FUSE)
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO-VIDEO, AUDIO-VISUAL
AWG	AMERICAN WIRE GAUGE
BAS	BUILDING AUTOMATION SYSTEM
BJ	BONDING JUMPER
BKR	BREAKER
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CKT	CIRCUIT
CLG	CEILING
CU	COPPER
DB	DECIBEL
DC	DIRECT CURRENT
DISC	DISCONNECT
DIV	SPECIFICATION DIVISION
DP	DISTRIBUTION PANELBOARD
DW	DISHWASHER
ECS	EMERGENCY COMMUNICATION SYSTEM
EGB	ELECTRICAL GROUNDING BUSBAR
ELEC	ELECTRICAL
EMD	ESTIMATED MAXIMUM DEMAND
EMGB	ELECTRICAL MAIN GROUNDING BUSBAR
EP	EXPLOSION PROOF
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EXISTING (TO BE) RELOCATED
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH
EWC	ELECTRIC WATER COOLER
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FC	FOOT CANDLE
FLA	FULL LOAD AMPS
FS	FLOW SWITCH
FSD	FIRE SMOKE DAMPER
FT	FEET
G	EQUIPMENT GROUNDING CONDUCTOR
GEN	GENERATOR
GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFPE	GROUND FAULT PROTECTION OF EQUIPMENT
GND	EQUIPMENT GROUNDING CONDUCTOR
HH	HANDHOLE
HOA	HAND-OFF-AUTOMATIC
HP	HORSE POWER
IC	INTERCOM
IG	ISOLATED GROUND
IN	INCH
JB	JUNCTION BOX
KAIC	THOUSAND AMPERE INTERRUPTING CIRCUIT
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATT
LT	LIGHT
LTG	LIGHTING
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MRTS	MOTOR RATED TOGGLE SWITCH
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MTG	MOUNTING
MTS	MAIN TRANSFER SWITCH
N	NEUTRAL
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NF	NON-FUSED
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OS&Y	OUTSIDE SCREW AND YOKE
P	POLE(S)
PA	PUBLIC ADDRESS
PB	PULL BOX
PH	PHASE
PIV	POST INDICATOR VALVE
PWR	POWER
QTY	QUANTITY
RCP	REFLECTED CEILING PLAN
RECPT	RECEPTACLE
REF	REFERENCE
REV	REVISION(S)
RM	ROOM
SCCR	SHORT CIRCUIT CURRENT RATING
SD	SMOKE DAMPER
SEC	SECONDARY
SPD	SURGE PROTECTION DEVICE
STD	STANDARD
SWBD	SWITCHBOARD
TBB	TELECOMMUNICATIONS BONDING BACKBONE
TC	TIME CLOCK
TGB	TELECOMMUNICATIONS GRONDING BUSBAR
TMGB	TELECOMMUNICATIONS MAIN GRONDING BUSBAR
TO	TELECOMMUNICATIONS OUTLET
TR	TELECOMMUNICATIONS ROOM
TS	TAMPER SWITCH
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTABLE POWER SUPPLY
V	VOLT
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE
WA	TELECOMMUNICATIONS WORK AREA
WG	WIRE GUARD
WP	WEATHER-PROOF (NEMA 3R)
XFMR	TRANSFORMER

NOTES

GENERAL DEMOLITION NOTES
(TYPICAL ALL ELECTRICAL DEMOLITION SHEETS)

1. ITEMS INDICATED ON DEMOLITION PLANS ARE BASED ON AS-BUILT DRAWINGS AND FIELD OBSERVATIONS AND ARE INTENDED TO GIVE THE BIDDER A GENERAL REPRESENTATION OF EXISTING CONDITIONS.
2. REMOVE ALL ITEMS SHOWN FULL-TONE OR NOTED ELSEWHERE IN THE DOCUMENTS TO BE REMOVED OR DEMOLISHED. DEMOLISH ADDITIONAL ITEMS NOT SHOWN ON DRAWINGS, BUT WHICH MUST BE REMOVED TO COMPLETE THE PROJECT.
3. ITEMS SHOWN HALF-TONE ARE EXISTING TO REMAIN.
4. RELOCATE ITEMS DENOTED 'ER'. SEE LIGHTING, POWER AND/OR SPECIAL SYSTEM SHEETS FOR NEW LOCATIONS. 'ER' IS DEFINED AS EXISTING (TO BE) RELOCATED.
5. EXISTING CONDUIT MAY REMAIN IF ALL THE FOLLOWING ARE TRUE:
   A. IT CAN BE REUSED TO FEED DEVICES INSTALLED UNDER THIS CONTRACT.
   B. IT DOES NOT INTERFERE WITH OTHER TRADES.
   C. IT WAS ORIGINALLY INSTALLED MEETING SPECIFICATIONS RELATED TO THIS PROJECT.
   D. IT WILL NOT BE EXPOSED IN A FINISHED AREA (UNLESS NOTED OTHERWISE).
6. PROVIDE ELECTRICAL DEMOLITION ASSOCIATED WITH MECHANICAL EQUIPMENT TO BE REMOVED. IN ADDITION TO DEVICES SHOWN, REFER TO MECHANICAL AND ARCHITECTURAL DEMOLITION SHEETS TO DETERMINE EQUIPMENT TO BE REMOVED.
7. MAINTAIN FUNCTIONALITY OF ALL EXISTING LOW VOLTAGE SYSTEMS INCLUDING, BUT NOT LIMITED TO, TELECOM CABLING NETWORKS, INTERCOM, CLOCKS, FIRE ALARM, SAFETY AND SECURITY DURING ALL PHASES OF CONSTRUCTION. PROVIDE TEMPORARY INTERCONNECTIONS AS REQUIRED TO ACCOMMODATE CONSTRUCTION SCHEDULE.

GENERAL RENOVATION NOTES
(TYPICAL ALL ELECTRICAL SHEETS)

1. MODIFICATIONS TO EXISTING POWER DISTRIBUTION EQUIPMENT: MATCH EXISTING MANUFACTURER, SWITCH TYPE, FUSE TYPE, BREAKER TYPE AND KAIC RATING FOR ALL INSTALLED DEVICES.
2. EXISTING PANEL DIRECTORIES AT PANELS AFFECTED BY WORK: PROVIDE UPDATED TYPED PANEL DIRECTORY. CONSULT OWNER FOR INPUT ON LABELING OF ALL EXISTING CIRCUITS.
3. DEVICES AND LIGHT FIXTURES DENOTED 'ER' ARE EXISTING TO BE RELOCATED. NOTIFY A/E IF DEVICES OR FIXTURES ARE DAMAGED.

GENERAL LIGHTING NOTES
(TYPICAL ALL LIGHTING SHEETS)

1. SEE LIGHT FIXTURE SCHEDULE AND SYMBOLS LEGEND FOR MOUNTING HEIGHTS, UNLESS NOTED OTHERWISE.
2. PROVIDE #10AWG MINIMUM CONDUCTORS FOR ALL EXTERIOR LIGHTING CIRCUITS.
3. SEE ARCHITECTURAL BUILDING ELEVATIONS FOR LOCATION OF BUILDING MOUNTED EXTERIOR LIGHT FIXTURES.
4. PROVIDE BEAD OF SILICON SEALANT AROUND RECESSED BACK BOX PERIMETER AT ALL BUILDING MOUNTED EXTERIOR LIGHT FIXTURE LOCATIONS.
5. CIRCUIT FIXTURES DENOTED WITH 'NL' AS UNSWITCHED NIGHT LIGHTS.
6. FIXTURES DENOTED WITH LOWER CASE LETTERS SHALL BE CONTROLLED BY SWITCHES DENOTED WITH THE SAME LOWER CASE LETTER IN EACH ROOM.

GENERAL POWER NOTES
(TYPICAL ALL POWER SHEETS)

1. VERIFY ANY NEUTRAL WIRES REQUIRED ON 1Ø OR 3Ø MECHANICAL UNITS FURNISHED UNDER DIVISION 23. IF REQUIRED, PROVIDE NEUTRAL.
2. PROVIDE DEDICATED 120-VOLT CIRCUITS TO ALL HVAC BAS CONTROL DEVICES AND PANELS. COORDINATE QUANTITY WITH DIVISION 23. UTILIZE NEAREST SPARE 120-VOLT, 20/1 BREAKER. LABEL TYPED PANEL DIRECTORY ACCORDING TO LOAD BEING SERVED.
3. IN ADDITION TO DEVICES SHOWN, SEE SCHEDULE SHEETS FOR CONNECTIONS TO ALL MECHANICAL EQUIPMENT.
4. LOCATE SWITCHES FOR CONTROL OF FANS IN TWO-GANG BOX WITH LIGHT SWITCH WHERE APPLICABLE.
5. PROVIDE #10AWG CONDUCTORS FOR ALL WARM AIR DRYER CIRCUITS. PROVIDE LOCKOUT DEVICE AT ALL BREAKERS SERVING WARM AIR DRYERS.

DEVICE BOX NOTES

1. SEE SYMBOLS LEGEND THIS SHEET FOR MOUNTING HEIGHTS UNLESS NOTED OTHERWISE ON DRAWINGS.
2. ALL MOUNTING HEIGHTS ARE TO CENTERLINE OF BOXES UNLESS NOTES OTHERWISE.
3. PROVIDE BOX EXTENDER FOR FLUSH INSTALLATION OF DEVICES LOCATED IN ARCHITECTURAL CASEWORK THAT IS FLUSH WITH ADJACENT WALL (SUCH AS RECEPTACLES FOR GARBAGE DISPOSERS).
4. FLOOR BOXES: OBTAIN OWNER APPROVAL OF ALL BOX LOCATIONS PRIOR TO ROUGH IN. PROVIDE DEVICE PLATES AT DEVICES AND BLANK PLATES AT ALL UNUSED COMPARTMENTS.
5. COORDINATE LOCATION OF DEVICE BOXES FOR SWITCHES, RECEPTACLES, AND SYSTEMS DEVICES WITH MARKERBOARDS. ADJUST BOX LOCATIONS TO AVOID MARKERBOARDS.
6. COORDINATE LOCATION OF DEVICE BOXES FOR SWITCHES, RECEPTACLES, AND SYSTEMS DEVICES WITH TACKBOARDS. ADJUST BOX LOCATIONS TO AVOID TACKBOARDS. PROVIDE BOX EXTENDER FOR A FLUSH INSTALLATION WHERE DEVICES MUST BE MOUNTED AT TACKBOARD/TACKWALL.
7. CEILING MOUNTED RECEPTACLES: AT SUSPENDED CEILINGS, ROUTE POWER TO RECEPTACLE VIA FLEXIBLE METALLIC CONDUIT WITH 6-FOOT SERVICE LOOP. FEED FMC FROM A J-BOX RIGIDLY SUPPORTED A MAXIMUM OF 24-INCHES ABOVE SUSPENDED CEILING OR AT BOTTOM OF STRUCTURE ABOVE, WHICHEVER IS LOWER. LOCATE J-BOX DIRECTLY ABOVE RECEPTACLE AND SUPPORT VIA STRUCTURE, OR VIA THREAD ROD AND UNISTRUT HUNG FROM STRUCTURE ABOVE IN HIGH STRUCTURE APPLICATIONS.
8. DEVICES RECESSED IN MULLIONS: BACK BOXES TO BE RECESSED FOR FLUSH NSTALLATION OF DEVICE AND WALLPLATE. EXTEND CONCEALED CONDUIT IN MULLION UP TO WALL ABOVE AND STUB OUT ABOVE ACCESSIBLE CEILING. IN AREAS WITH NO CEILING, EXTEND CONDUIT TOWARDS CABLING SOURCE TO ABOVE NEAREST ACCESSIBLE CEILING.

GENERAL SYSTEMS NOTES
DIVISION 26 WORK

(TYPICAL ALL SPECIAL SYSTEMS PLANS)

1. TELECOMMUNICATIONS OUTLETS: PROVIDE TWO-GANG BOX (2.25-INCH DEEP MINIMUM) WITH SINGLE-GANG STRAP MOUNT PLASTER RING AND 1-INCH CONDUIT STUBBED INTO ACCESSIBLE SPACE ABOVE FINISHED CEILING (EXCEPTION: VOICE-ONLY OR VIDEO-ONLY OUTLETS PER NOTE BELOW).
2. TELECOMMUNICATIONS OUTLET INDICATED AS ROUGH IN ONLY (NO SUBSCRIPTS): INSTALL PER NOTE ABOVE, WITH BLANK 302SS SINGLE-GANG WALLPLATE.
3. VOICE-ONLY OR VIDEO-ONLY TELECOMMUNICATIONS OUTLET: PROVIDE SINGLE-GANG BOX WITH 1-INCH CONDUIT STUBBED INTO ACCESSIBLE SPACE ABOVE FINISHED CEILING.
4. MISCELLANEOUS LOW VOLTAGE OUTLETS (CALL STATIONS, HANDSETS, VOLUME CONTROL, MICROPHONE OUTLETS, SURFACE-MOUNT WALL SPEAKERS AND FIRE ALARM DEVICES): PROVIDE SINGLE-GANG BOX WITH 3/4-INCH CONDUIT STUBBED INTO ACCESSIBLE SPACE ABOVE FINISHED CEILING.
5. INSULATED BUSHINGS: PROVIDE BUSHINGS ON ALL CONDUIT STUB UPS, INCLUDING BUT NOT LIMITED TO, OUTLETS FOR TELECOMMUNICATIONS, FIRE ALARM, SECURITY, ACCESS CONTROL, MASS NOTIFICATION, PUBLIC ADDRESS, ALL OTHER LOW VOLTAGE INTERCOMMUNICATIONS AND UNUSED STUB-UPS OR STUB-UPS INDICATED FOR FUTURE USE.
6. FLOOR BOXES CONTAINING TELECOMMUNICATIONS OUTLETS: FOR EACH LOW-VOLTAGE COMPARTMENT, ROUTE 1-INCH CONDUIT WITH PULL STRING UNDERFLOOR, UP NEAREST WALL, AND STUB INTO ACCESSIBLE SPACE ABOVE FINISHED CEILING. LABEL CONDUIT END 'FLOOR BOX'
7. SLEEVES FOR LOW VOLTAGE CABLES: PROVIDE 2-INCH SLEEVES UNLESS NOTED OTHERWISE. COORDINATE WITH PATH OF DUCTWORK AND GWB CEILING TO ENSURE ACCESSIBILITY, EXTEND SLEEVES AS REQUIRED. INSTALL ALL SLEEVES 4-INCHES ABOVE HIGHER CEILING OF TWO ADJACENT SPACES. REFER TO ROOM FINISH SCHEDULES AND REFLECTED CEILING PLANS FOR CEILING HEIGHTS. STUB SLEEVES INTO JOIST SPACE OF FINISHED ROOMS WITH EXPOSED STRUCTURE. PROVIDE INSULATED BUSHINGS ON BOTH ENDS OF ALL SLEEVES, INCLUDING UNUSED SLEEVES. PROVIDE GROUT OR ESCUTCHEONS TO SECURE SLEEVES TO WALL. PROVIDE FIRE-RATED SLEEVES AT ALL FIRE-RATED WALLS.
8. PROVIDE ADDITIONAL CONDUIT, BOXES, CONDUCTORS AND OVERCURRENT PROTECTION FOR 120-VOLT BRANCH CIRCUITS NOT SPECIFICALLY COVERED UNDER DIVISION 26 WORK, BUT REQUIRED TO COMPLETE DIVISION 08 AND 28 WORK. DEVICES SHALL INCLUDE, BUT NOT BE LIMITED TO, POWER SUPPLIES FOR DOOR HARDWARE, ACCESS CONTROL, FIRE ALARM AND VIDEO SURVEILLANCE.
9. CARD READERS: PROVIDE RECESSED SINGLE-GANG BOX WITH GASKETED BLANK COVERPLATE AND EMPTY 1-INCH CONDUIT STUBBED INTO NEAREST ACCESSIBLE SPACE ABOVE FINISHED CEILING OR JOIST SPACE OF ADJACENT EXPOSED STRUCTURE. LABEL CONDUIT END 'CARD READER'.
10. PROVIDE WATERFALL DROPOUTS AT ALL CABLE TRAY LOCATIONS ABOVE RUNWAYS, WALL/FLOOR MOUNTED RACKS, AND EQUIPMENT ENCLOSURES.
11. AUDIO VISUAL (AV) SYSTEMS: PROVIDE RECESSED BOXES, CONDUIT AND PULL STRINGS FOR ALL SYSTEM COMPONENTS.

GENERAL SYSTEMS NOTES
DIVISION 27 WORK

(TYPICAL ALL SPECIAL SYSTEMS PLANS)

1. ALL SPEAKERS AND HORN-TYPE SPEAKERS ARE PART OF THE INTERCOM SYSTEM, UNLESS NOTED OTHERWISE.
2. PROVIDE SURFACE MOUNT ENCLOSURE AND BAFFLE FOR ALL SPEAKERS IN FINISHED SPACES WITH NO CEILINGS (EXPOSED STRUCTURE).
3. PROVIDE WIREGUARDS ON ALL CLOCKS IN GYMNASIUMS.
4. UTILIZE SLEEVES AND FIRE RATED SLEEVES AT RATED WALLS PROVIDED UNDER DIVISION 26 FOR INSTALLATION OF ALL LOW VOLTAGE CABLING. FOLLOW INDUSTRY STANDARDS TO MAINTAIN 40% FILL REQUIREMENTS IN ALL SLEEVES (SUPERSEDES NEC - DO NOT FILL SLEEVES TO CAPACITY). PROVIDE ADDITIONAL SLEEVES MEETING DIVISION 26 REQUIREMENTS AS REQUIRED.
5. SYSTEM PANEL LOCATIONS: AUXILIARY SYSTEM PANELS, POWER SUPPLIES OR OTHER EQUIPMENT ENCLOSURES SHALL NOT BE LOCATED IN TELECOM ROOMS UNLESS NOTED OTHERWISE. IF DRAWINGS DO NOT DEPICT LOCATIONS FOR AUXILIARY COMPONENTS, CONSULT OWNER OR A/E FOR APPROVED LOCATIONS PRIOR TO EQUIPMENT INSTALL.

GENERAL SYSTEMS NOTES
DIVISION 28 WORK

(TYPICAL ALL SPECIAL SYSTEMS PLANS)

1. PROVIDE MINIMUM CANDELA RATINGS FOR ROOMS WITH WALL MOUNTED VISUAL NOTIFICATION APPLIANCES AS FOLLOWS:
   - <20'x20' = 15cd
   - <28'x28' = 30cd
   - <40'x40' = 60cd
   - >40'x40' = 110cd
2. PROVIDE MINIMUM CANDELA RATINGS FOR ROOMS WITH CEILING MOUNTED VISUAL NOTIFICATION APPLIANCES ON MAXIMUM 10' HIGH CEILING AS FOLLOWS:
   - <20'x20' = 15cd
   - <30'x30' = 30cd
   - <40'x40' = 60cd
   - >40'x40' = 110cd
3. INCREASE DEVICE RATINGS/SETTINGS WHEN LOCATED OFF-CENTER IN ROOMS TO MAINTAIN NFPA COVERAGE.
4. VISUAL DEVICES IN CORRIDORS SHALL BE 15cd. VISUAL DEVICES LOCATED IN OTHER AREAS SHALL BE 110cd UNLESS NOTED OTHERWISE.
5. IN ADDITION TO DEVICES SHOWN, SEE SCHEDULE SHEETS FOR FIRE ALARM SYSTEM DEVICES CONNECTIONS TO MECHANICAL EQUIPMENT.
6. PROVIDE FIRE ALARM MONITORING OF ALL FLOW AND TAMPER SWITCHES. CONFIRM QUANTITIES AND LOCATION WITH DIVISION 21.
7. UTILIZE SLEEVES AND FIRE RATED SLEEVES AT RATED WALLS PROVIDED UNDER DIVISION 26 FOR INSTALLATION OF ALL LOW VOLTAGE CABLING. FOLLOW INDUSTRY STANDARDS TO MAINTAIN 40% FILL REQUIREMENTS IN ALL SLEEVES (SUPERSEDES NEC - DO NOT FILL SLEEVES TO CAPACITY). PROVIDE ADDITIONAL SLEEVES MEETING DIVISION 26 REQUIREMENTS AS REQUIRED.
8. SYSTEM PANEL LOCATIONS: AUXILIARY SYSTEM PANELS, POWER SUPPLIES OR OTHER EQUIPMENT ENCLOSURES SHALL NOT BE LOCATED IN TELECOM ROOMS UNLESS NOTED OTHERWISE. IF DRAWINGS DO NOT DEPICT LOCATIONS FOR AUXILIARY COMPONENTS, CONSULT OWNER OR A/E PRIOR TO EQUIPMENT INSTALLATION.
9. DUCT SMOKE DETECTION: DETERMINE QUANTITY AND PLACEMENT OF DETECTORS REQUIRED FOR COVERAGE OF DUCTWORK BASED ON NFPA REQUIREMENTS. PROVIDE MECHANICAL EQUIPMENT FAN SHUTDOWN RELAY AT ALL DUCT DETECTORS. SEE HVAC PLANS FOR EQUIPMENT LOCATIONS. COORDINATE SHUTDOWN CONTROL WITH DIVISION 23.
10. SMOKE DAMPERS AND FIRE-SMOKE DAMPERS: PROVIDE FIRE ALARM CONNECTION AND 120-VOLT POWER TO EACH FIRE/SMOKE DAMPER SHOWN ON HVAC PLANS. PROVIDE DEDICATED CIRCUIT TO DAMPERS, ROUTED THROUGH NORMALLY CLOSED FIRE ALARM RELAY, MOUNTED ON WALL IN NEAREST ELECTRICAL ROOM. COORDINATE WITH DAMPER MANUFACTURER FOR SPECIFIC DAMPER LOAD REQUIREMENTS. RELAY SHALL BE CONTROLLED BY FACP, SUCH THAT, ON GENERAL ALARM DAMPERS CLOSE. FIRE ALARM CONNECTION TO DAMPER SHALL BE A SUPERVISORY CIRCUIT MONITORING STATUS OF INTEGRAL SMOKE DETECTOR, AND SHALL PROVIDE REMOTE FIRE/SMOKE DAMPER RESET. FACP SHALL INITIATE A SUPERVISORY SIGNAL WHEN INTEGRAL DETECTOR GOES INTO ALARM. FIRE/SMOKE DAMPERS MAY BE GROUPED TOGETHER ON SUPERVISORY CIRCUITS TO SIMPLIFY WIRING. COORDINATE REQUIREMENTS WITH FIRE/SMOKE DAMPER MANUFACTURER. UTILIZE SPARE 20/1 BREAKERS. LABEL TYPED PANEL DIRECTORY 'FIRE/SMOKE DAMPERS - (INDICATE AREA SERVED)'.
11. PROVIDE WIREGUARDS ON ALL FIRE ALARM STROBES AND HORN/STROBES IN GYMNASIUMS.

GENERAL SYMBOLS

- DETAIL NUMBER / CROSS REFERENCE / SHEET NUMBER (? / ??? SIM)
- DETAIL REFERENCE (? / ??? SIM)
- BUILDING ELEVATION / INTERIOR ELEVATION (? East)
- KEYED NOTE
- COLUMN GRID LINE
- ROOM NAME / ROOM NUMBER (ROOM NAME ???)
- DOOR NUMBER
- EQUIPMENT TAG (X)
- REVISION NUMBER (DESCRIPTION)

ELECTRICAL SYMBOLS

LIGHTING

LIGHTING FIXTURE TAG

- XXX — FIXTURE TYPE
- XXX-X — CKT DESIGNATION (PNL - CKT NO.)
- XXX-X — RELAY PANEL - RELAY NO. OR LOCAL SWITCH DESIGNATION

LIGHTING FIXTURES

- LIGHTING FIXTURE
- LIGHTING FIXTURE ON EMERGENCY SYSTEM
- CEILING FIXTURE, SURFACE, RECESSED OR PENDANT
- LIGHTING FIXTURE ON EMERGENCY SYSTEM
- LIGHTING TRACK, TRACK MOUNTED LIGHT FIXTURES
- LIGHTING FIXTURE
- WALL MOUNTED LIGHTING FIXTURE
- WALL WASHER
- HIGH BAY LIGHTING FIXTURE
- WALL MOUNTED LIGHTING FIXTURE
- SELF CONTAINED EMERGENCY LIGHTING UNIT MOUNT 94-INCHES AFF, UNO
- EXIT SIGN, CEILING MOUNTED, DIRECTIONAL ARROW(S) AS INDICATED
- EXIT SIGN, WALL MOUNTED, DIRECTIONAL ARROW(S) AS INDICATED. MOUNT 94-INCHES AFF, UNO

AREA LIGHTING

- SITE LIGHTING - POLE
- POLE MOUNTED AREA LIGHTING FIXTURE
- POLE WITH POLE MOUNTED AREA LIGHTING FIXTURE
- WALL MOUNTED AREA LIGHTING FIXTURE
- IN GRADE LIGHT FIXTURE
- BOLLARD LIGHT FIXTURE

LIGHTING CONTROL DEVICES

- RPx — LIGHTING CONTROL PANEL
- CVx — CENTRAL INVERTER
- R — LOW VOLTAGE RELAY
- PC — PHOTOELECTRIC CELL
- LC — LIGHTING CONTACTOR
- BAT — REMOTE EMERGENCY BATTERY PACK

SWITCHES AND WALL-BOX CONTROLS

SWITCHES: MOUNT 42-INCHES AFF UNO

- SUPERSCRIPT , SWITCH SHALL CONTROL FIXURE DENOTED WITH SAME LOWER CASE LETTER
- SWITCH SYMBOL
- SUBSCRIPT, SWITCH TYPE - SEE BELOW
- LINE THRU SWITCH INDICATES A KEY OPERATED SWITCH

S	SWITCH, SINGLE POLE
S_2	SWITCH, DOUBLE POLE
S_3	SWITCH, 3-WAY
S_4	SWITCH, 4-WAY
S_D	SWITCH, DIMMER
S_E	SWITCH, EMERGENCY
S_L	SWITCH, LOW VOLTAGE
S_M	SWITCH, MASTER
S_O	SWITCH, WALL-BOX OCCUPANCY SENSOR
S_{O2}	SWITCH, WALL-BOX OCCUPANCY SENSOR, 2-POLE
S_P	SWITCH WITH PILOT LIGHT
S_R	SWITCH, LOW VOLTAGE, ASSOCIATED WITH RELAY PANEL
S_T	SWITCH, TIMER
S_V	SWITCH, WALL-BOX VACANCY SENSOR
S_X	SWITCH, EXPLOSION-PROOF

CEILING MOUNTED LIGHTING CONTROL DEVICES
MAXIMUM MOUNTING HEIGHT OF 10-FEET AFF

- OS — OCCUPANCY SENSOR
- VS — VACANCY SENSOR

WALL MOUNTED LIGHTING CONTROL DEVICES:
MOUNT 94-INCHES AFF, UNO

- OS — OCCUPANCY SENSOR
- VS — VACANCY SENSOR

THEATRICAL LIGHTING DEVICES:

- LCD — THEATRICAL LIGHTING LCD STATION MOUNT 50-INCHES AFF, UNO
- E — THEATRICAL LIGHTING ENTRY STATION MOUNT 42-INCHES AFF, UNO
- TO — THEATRICAL OUTLET BOX MOUNT 18-INCHES AFF, UNO
- TN — THEATRICAL NETWORK OUTLET MOUNT 18-INCHES AFF, UNO
- TC — THEATRICAL CONTROL CONSOLE OUTLET MOUNT 18-INCHES AFF, UNO

POWER

- CIRCUIT HOME RUN
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT STUB-UP
- CONDUIT SLEEVE
- CONDUIT SEAL
- CONDUIT CONCEALED IN CEILING OR WALLS, POWER
- CONDUIT CONCEALED IN CEILING OR WALLS, OTHER (* = SEE ABBREVIATIONS)
- CONDUIT CONCEALED IN FLOOR OR UNDERGROUND, POWER
- CONDUIT CONCEALED IN FLOOR OR UNDERGROUND, OTHER (* = SEE ABBREVIATIONS)
- EXPOSED CONDUIT, POWER
- EXPOSED CONDUIT, OTHER (* = SEE ABBREVIATIONS)
- FRS — FIRE RATED SLEEVE
- T — TRANSFORMER
- XXX — BRANCH CIRCUIT PANELBOARD MOUNT 72-INCHES TO TOP
- XXX — DISTRIBUTION PANELBOARD MOUNT 72-INCHES TO TOP
- EQUIPMENT CABINET, AS NOTED
- XXX — SWITCHBOARD
- MOTOR STARTER OR DRIVE
- DISCONNECT SWITCH
- COMBINATION STARTER / DISCONNECT SWITCH
- CT — CURRENT TRANSFORMER ENCLOSURE
- M — METER
- GEN — GENERATOR
- ATS — AUTOMATIC TRANSFER SWITCH
- SYSTEM GROUND ELECTRODE
- T — THERMOSTAT
- MUSHROOM SWITCH
- MH — ELECTRICAL MANHOLE
- HH — ELECTRICAL HAND HOLE
- M — MOTOR CONNECTION, HORSEPOWER AS INDICATED
- S_F — FUSE AND SWITCH ASSEMBLY
- S_T — MANUAL CONTROLLER WITH THERMAL OVERLOAD
- S_M — MANUAL CONTROLLER W/O THERMAL OVERLOAD
- B — CIRCUIT BREAKER ENCLOSURE
- PB — PULL BOX
- EQUIPMENT CONNECTION
- CABLE TRAY, LADDER TYPE OR RUNWAY
- CABLE TRAY
- MULTI-OUTLET ASSEMBLIES MOUNT 18-INCHES AFF, UNO WHERE DENOTED 'AC', MOUNT ABOVE COUNTER
- DIVIDED SURFACE RACEWAY MOUNT 18-INCHES AFF, UNO WHERE DENOTED 'AC', MOUNT ABOVE COUNTER

PUSHBUTTON STATION: MOUNT 42-INCHES AFF UNO

- SWITCH, PUSH BUTTON, SINGLE
- SWITCH, PUSH BUTTON, DOUBLE
- SWITCH, PUSH BUTTON, TRIPLE

RECEPTACLES: MOUNT 18-INCHES AFF, UNO

DIAGONAL LINE THROUGH SYMBOL OR DENOTED 'AC' INDICATES MOUNT DEVICE ABOVE COUNTER.
WHERE INDICATED AS 'MOUNT ABOVE COUNTER' MOUNT BOTTOM OF BOX 2-INCHES ABOVE TOP OF BACKSPLASH OR 6-INCHES ABOVE COUNTERTOP IF NO BACKSPLASH EXISTS.

LABELS SHALL BE MACHINE PRINTED, UNO

- SIMPLEX RECEPTACLE
- DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE, GFI TYPE
- DUPLEX RECEPTACLE, MOUNT ABOVE COUNTER
- DUPLEX RECEPTACLE, GFI TYPE, MOUNT ABOVE COUNTER
- FOURPLEX RECEPTACLE
- FOURPLEX RECEPTACLE, GFI TYPE
- FOURPLEX RECEPTACLE, MOUNT ABOVE COUNTER
- FOURPLEX RECEPTACLE, GFI TYPE, MOUNT ABOVE COUNTER
- DUPLEX RECEPTACLE, FLUSH IN CEILING
- DUPLEX RECEPTACLE, HORIZONTALLY MOUNTED
- DUPLEX RECEPTACLE, HORIZ. MTD, GFI TYPE
- DUPLEX RECEPTACLE, HORIZ. MTD, ABOVE COUNTER
- DUPLEX RECEPTACLE, HORIZ. MTD, GFI TYPE, MOUNT ABOVE COUNTER
- R — WEATHER RESISTANT GFI DUPLEX RECEPTACLE, ROOF MOUNT 18-INCHES ABOVE ADJACENT STRUCTURE WITH A WEATHERPROOF, IN-USE COVER
- WP — WEATHER RESISTANT GFI DUPLEX RECEPTACLE, MOUNT 18-INCHES AFF WITH A WEATHERPROOF, IN-USE COVER
- EWC — STD DUPLEX RECEPTACLE TO SERVE ELECTRIC WATER COOLER, MOUNT AT HEIGHT PER EQUIPMENT MANUFACTURER'S INSTALLATION GUIDELINES. WIRE TO GFCI BKR IN PANELBOARD.
- TV — DUPLEX RECEPTACLE TO SERVE TELEVISION, MOUNT AT SAME HEIGHT AND WITHIN 8-INCHES OF ADJACENT TV OUTLET
- DUPLEX RECEPTACLE, EMERGENCY
- FOURPLEX RECEPTACLE, EMERGENCY
- DUPLEX RECEPTACLE, LOWER SWITCH
- DUPLEX RECEPTACLE, SWITCHED
- RANGE RECEPTACLE, MOUNT 8-INCHES AFF
- SPECIAL RECEPTACLE, DEEP WELL BOX
- FLUSH FLOOR OUTLET BOX UNO
- FLUSH FLOOR BOX WITH DUPLEX RECEPTACLE UNO
- MULTI-DEVICE FLOOR BOX WITH DUPLEX RECEPTACLE AND TELECOMMUNICATIONS OUTLETS
- U — USB ONLY RECEPTACLE
- U — RECEPTACLE WITH USB PORTS
- J — FLUSH JUNCTION BOX, CEILING MOUNTED
- J P — JUNCTION BOX FOR FUTURE PROJECTOR POWER MOUNT 24-INCHES ABOVE SUSPENDED CEILING MOUNT TIGHT TO CEILING AT EXPOSED STRUCTURE LABEL BOX COVER 'PROJECTOR POWER'
- JUNCTION BOX ABOVE SUSPENDED CEILING WITH FLEX CONNECTION
- J — FLUSH JUNCTION BOX, WALL MOUNTED
- J — SURFACE JUNCTION BOX, WALL MOUNTED
- J — SURFACE JUNCTION BOX, CEILING MOUNTED
- H — HAND DRYER, INSTALL HAND DRYER SPECIFIED IN DIV. 11

COMMUNICATIONS

TELECOMMUNICATIONS OUTLETS: MOUNT 18-INCHES AFF, UNO, AND WITHIN 8-INCHES OF ADJACENT RECEPTACLE
WHERE DENOTED 'AC', MOUNT ABOVE COUNTER
WHERE DENOTED 'C', MOUNT FLUSH IN CEILING

- X,Y,Z — TELECOMMUNICATIONS OUTLET PROVIDE JACKS UNDER A COMMON FACEPLATE:
  - X = QTY OF VOICE JACKS
  - Y = QTY OF DATA JACKS
  - Z = QTY OF VIDEO JACKS
- TELECOMMUNICATIONS OUTLET MOUNTED IN FLOOR BOX
- AP — WIRELESS ACCESS POINT
- AP — WIRELESS ACCESS POINT, WALL MOUNTED
- ANALOG VOICE ONLY TELECOM OUTLET (TELEPHONE OUTLET) MOUNT 18-INCHES AFF, UNO. EQUIVALENT TO 1,0,0 WHERE DENOTED 'W' MOUNT 50-INCHES AFF
- TV — VIDEO ONLY TELECOM OUTLET (TELEVISION OUTLET) MOUNT 94-INCHES AFF, UNO. EQUIVALENT TO 0,0,1
- TV — TELEVISION OUTLET, FLUSH IN CEILING
- AV — AV OUTLET. PROVIDE TWO BOXES PER DETAIL 23 / E6.03.
- FLOOR MOUNTED TELECOMMUNICATIONS RACK

CLOCKS: MOUNT 94-INCHES AFF, UNO

- CLOCK - WALL MOUNT
- DS — CLOCK - DOUBLE FACE
- C — CLOCK - OUTLET
- M — CLOCK - MASTER
- DS — CLOCK - CEILING MOUNT, DOUBLE FACE

BELLS, BUZZERS, CHIMES AND WALL SPEAKERS:
MOUNT 94-INCHES AFF, UNO

- CLASS PROGRAM BELL
- BUZZER
- C — CHIME
- S — SPEAKER, WALL
- S — SPEAKER, FLUSH IN CEILING, ENCLOSED IN BACKBOX WHERE EXPOSED
- S PA — PUBLIC ADDRESS (A/V) SYSTEM SPEAKER, FLUSH IN CEILING
- H — SPEAKER/HORN, WALL
- IC — INTERCOM CALLBACK STATION MOUNT 42-INCHES AFF
- IC 2 — TWO-WAY INTERCOM/CALL STATION COMBINATION UNIT MOUNT 42-INCHES AFF
- IC M — INTERCOM MASTER STATION OUTLET MOUNT 18-INCHES AFF
- INTERCOM HANDSET MOUNT 50-INCHES AFF
- V — VOLUME CONTROL, WALL MOUNT 42-INCHES AFF
- M — MICROPHONE OUTLET, WALL MOUNT 18-INCHES AFF
- M — FLUSH FLOOR BOX WITH MICROPHONE OUTLET
- D — DIRECTORS HEADSET

SAFETY

- FACP — FIRE ALARM CONTROL PANEL MOUNT CENTER OF DISPLAY 54-INCHES AFF
- FAA — FIRE ALARM ANNUNCIATOR PANEL MOUNT CENTER OF DISPLAY 54-INCHES AFF
- LOC — LOCAL OPERATOR'S CONSOLE MOUNT CENTER OF DISPLAY 54-INCHES AFF
- NAC — NOTIFICATION APPLIANCE CIRCUIT CABINET MOUNT CENTER OF DISPLAY 54-INCHES AFF
- F — MANUAL FIRE ALARM PULL STATION MOUNT 42-INCHES AFF

FIRE ALARM A/V DEVICES: MOUNT 94-INCHES AFF, OR 6-INCHES BELOW CEILING, WHICEVER IS HIGHER, UNO

- F — FIRE ALARM BELL
- F — FIRE ALARM HORN
- F — FIRE ALARM VISUAL WARNING SIGNAL
- F — FIRE ALARM BELL WITH VISUAL WARNING SIGNAL
- F — FIRE ALARM HORN WITH VISUAL WARNING SIGNAL
- F — MINI FIRE ALARM HORN WITH VISUAL WARNING SIGNAL
- F — FIRE ALARM SPEAKER WITH VISUAL WARNING SIGNAL
- F — FIRE ALARM SPEAKER, FLUSH IN CEILING
- F — FIRE ALARM SPEAKER WITH VISUAL WARNING SIGNAL, CEILING
- F — FIRE ALARM VISUAL WARNING SIGNAL, CEILING
- E — ECS SPEAKER, FLUSH IN CEILING
- E — ECS SPEAKER WITH VISUAL WARNING SIGNAL, CEILING
- E — ECS VISUAL WARNING SIGNAL, CEILING
- S — SPRINKLER SYSTEMS ELECTRIC BELL ALARM
- D — FIRE ALARM MAGNETIC DOOR HOLDER MOUNT 74-INCHES AFF
- L — REMOTE INDICATOR LAMP
- OSY — OS&Y VALVE
- FS — WATER FLOW ALARM SWITCH
- TS — TAMPER SWITCH
- T — BEAM TRANSMITTER
- R — BEAM RECEIVER
- FF — FIRE FIGHTERS TELEPHONE MOUNT 54-INCHES AFF
- DAS ANTENNA
- I D — SMOKE DETECTOR - IONIZATION TYPE (D = DUCT)
- P D — SMOKE DETECTOR - PHOTOELECTRIC TYPE (D = DUCT)
- I — SMOKE DETECTOR - IONIZATION TYPE
- P — SMOKE DETECTOR - PHOTOELECTRIC TYPE
- HEAT DETECTOR RATE-OF-RISE AND FIXED TEMPERATURE, 135 F
- HEAT DETECTOR, RATE-OF-RISE AND FIXEDTEMPERATURE, 200 F
- HEAT DETECTOR, FIXED TEMPERATURE ONLY, 135 F
- HEAT DETECTOR, FIXED TEMPERATURE ONLY, 200 F

SECURITY

INTRUSION DETECTION

- ID — INTRUSION DETECTOR, CEILING
- ID — INTRUSION DETECTOR, WALL
- MD LR — MOTION DETECTOR - LONG RANGE
- MD BR — MOTION DETECTOR - BROAD RANGE
- MD 360 — MOTION DETECTOR - 360 DEGREES
- GB — GLASS BREAK DETECTOR
- K — SECURITY KEYPAD MOUNT 48-INCHES AFF

VIDEO SURVEILLANCE

- XXX — VIDEO CAMERA - CEILING
- XXX — VIDEO CAMERA - WALL

ACCESS CONTROL

- XXX — DOOR TAG
- ACP — ACCESS CONTROL SYSTEM CONTROL PANEL
- P — DOOR POSITION SWITCH
- PS — POWER SUPPLY, 120V INPUT
- CR — CARD READER MOUNT 36-INCHES AFF
- EL — DOOR WITH ELECTRIFIED DOOR HARDWARE. REFER TO DOOR HARDWARE SPECIFICATIONS.

ONE-LINE DIAGRAM

X — ENCLOSED CONTROLLER (ACROSS-THE-LINE UNO) MOUNT 60-INCHES AFF TO TOP
- X = STARTER NEMA SIZE

XX/X, XXAF, XX — ENCLOSED SWITCH; MOUNT 60-INCHES AFF TO TOP
- XX/X = AMP RATING / NO. OF POLES
- XXAF = FUSE SIZE; AF=AMP FUSE; NF=NO FUSE
- X = STARTER NEMA SIZE

XX/X, XXAF, XX — COMBINATION CONTROLLER \ DISCONNECT; MOUNT 60-INCHES AFF TO TOP
- XX/X = AMP RATING / NO. OF POLES
- XXAF = FUSE SIZE; AF=AMP FUSE; NF=NO FUSE
- XX = ENCLOSURE NEMA RATING; BLANK=NEMA 1; WP=NEMA 3R

M — METER SOCKET/METER

SPD — SURGE PROTECTION DEVICE

T, XX — TRANSFORMER
- T = TRANSFORMER ID
- XX = SIZE

XXX/X, LSIG — BREAKER
- XXX/X = AMP RATING / POLES
- LSIG = ADJUSTABLE SETTINGS (WHERE NOTED)
  - L = LONG TIME
  - S = SHORT TIME
  - I = INSTANTANEOUS
  - G = GROUND FAULT PROTECTION OF EQUIPMENT
- GFPE = GROUND FAULT PROTECTION OF EQUIPMENT
- ERMS = ENERGY REDUCTION MAINTENANCE SWITCH

XXX/3, XXX — FUSIBLE SWITCH
- XXX/X = SWITCH AMP RATING / POLES
- XXX = FUSE SIZE

GROUNDING ELECTRODE SYSTEM

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ELECTRICAL SYMBOLS AND ABBREVIATIONS

E0.1

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LEGEND NOTES

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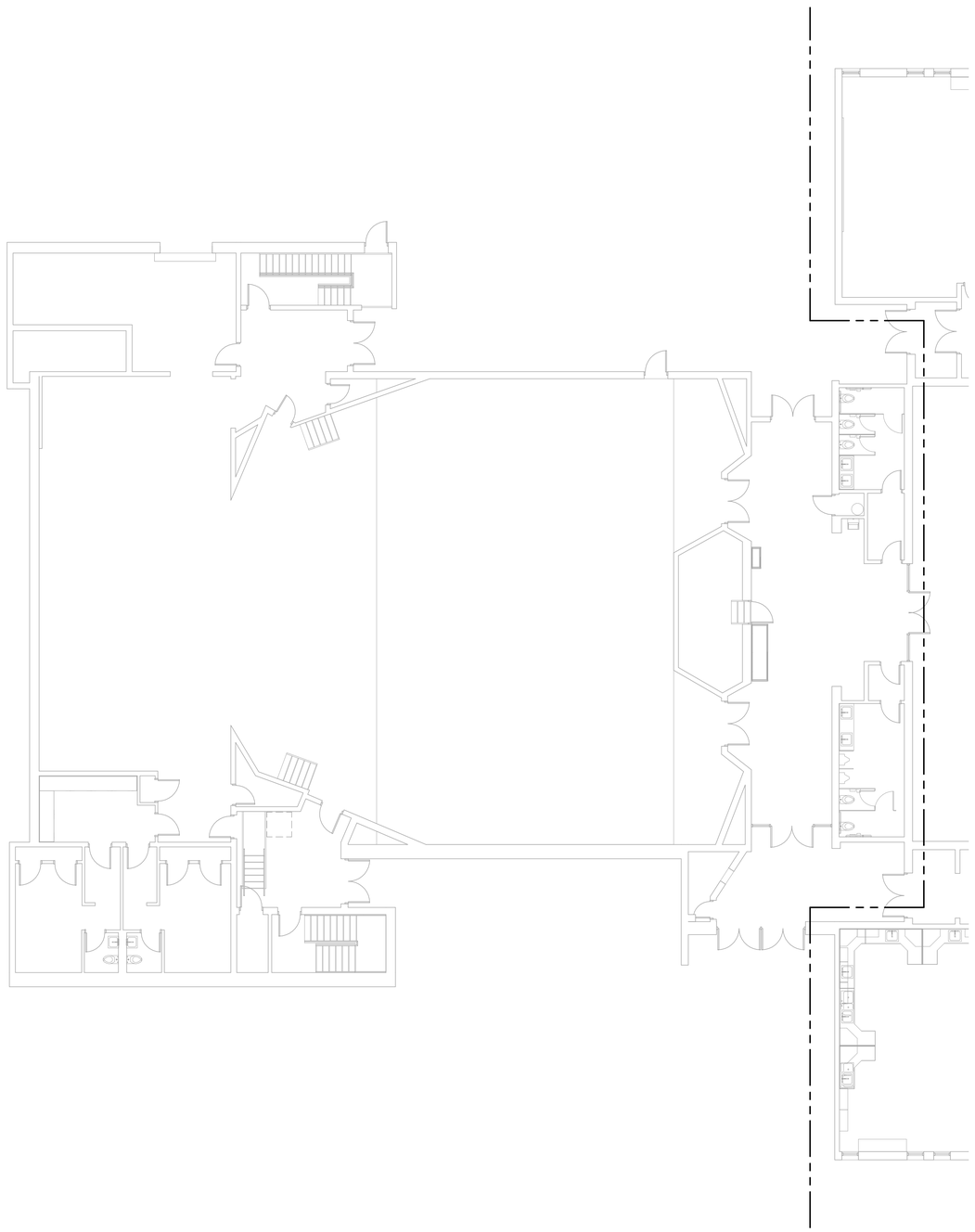

ELECTRICAL DEMOLITION PLAN - AREA A

SCALE: 1/8" = 1'-0"

NORTH

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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

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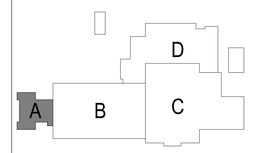
KEY PLAN



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ELECTRICAL DEMOLITION PLAN - AREA A

ED1.1A

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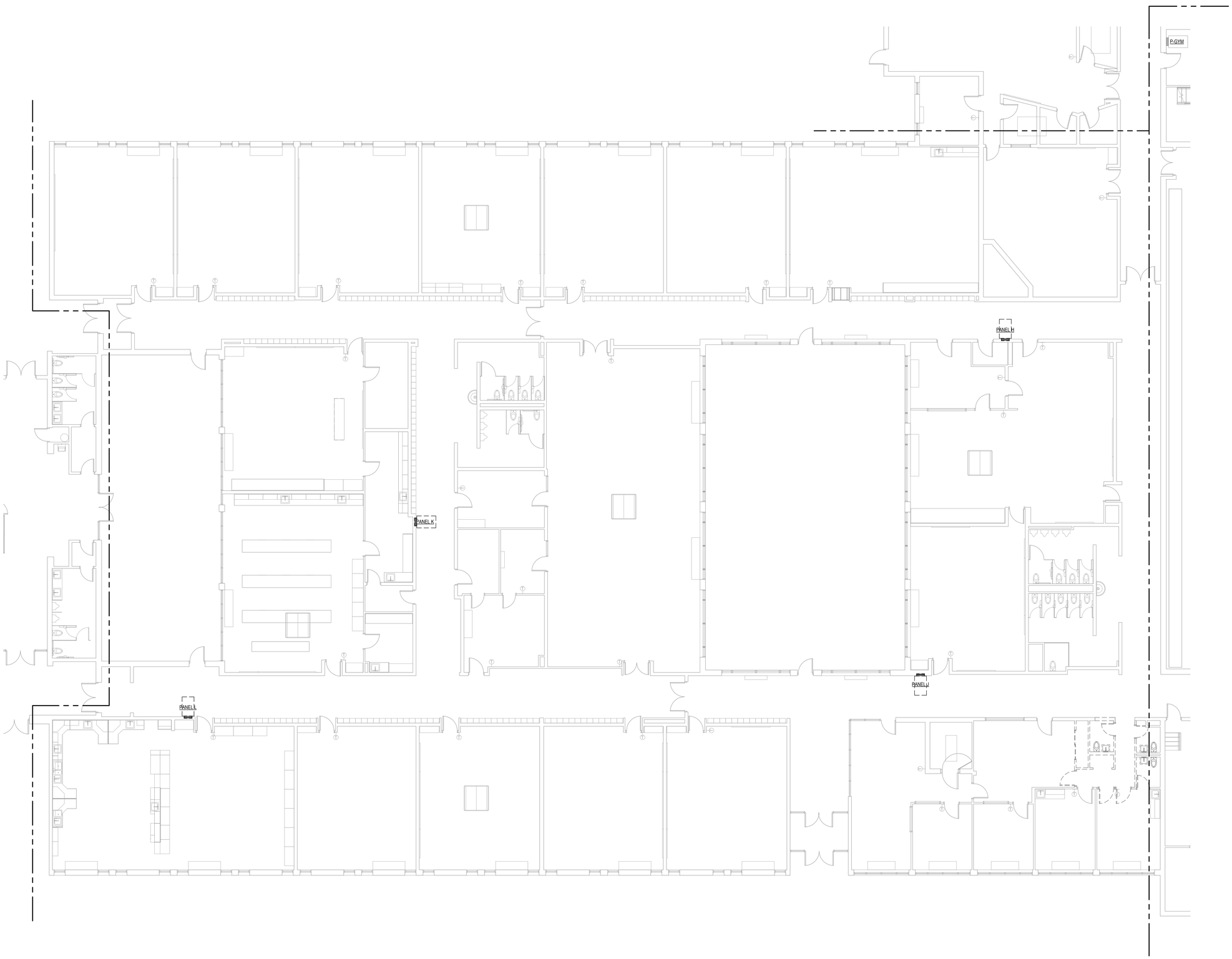
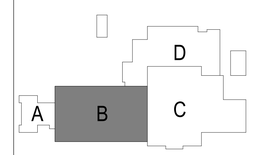


ELECTRICAL DEMOLITION PLAN - AREA B

SCALE: 1/8" = 1'-0"

NORTH

KEY PLAN



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ELECTRICAL DEMOLITION PLAN - AREA B

ED1.1B

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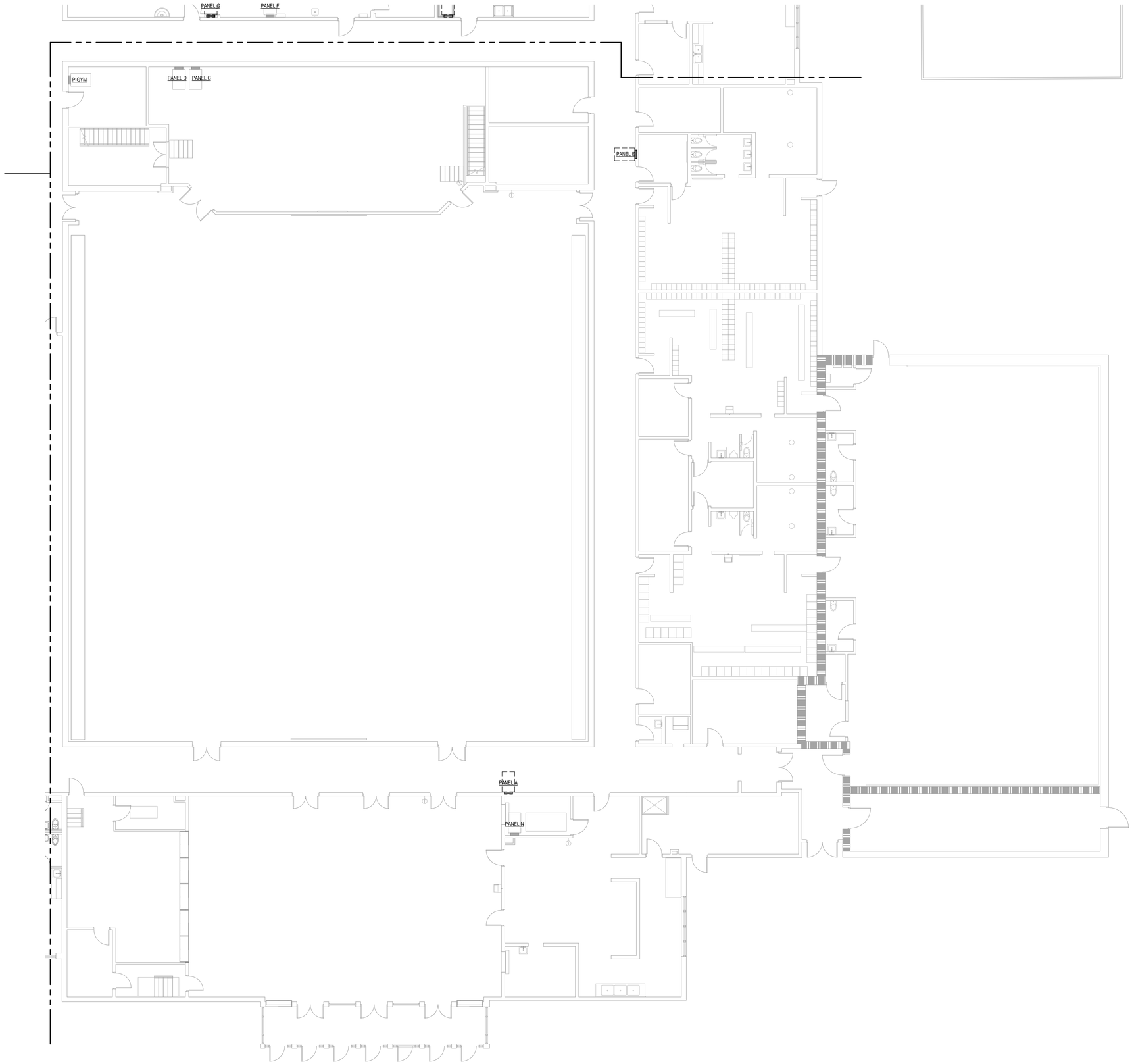

ELECTRICAL DEMOLITION PLAN - AREA C
SCALE: 1/8" = 1'-0"
NORTH

LEGEND NOTES

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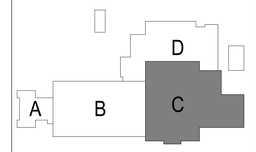
KEY PLAN



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ELECTRICAL DEMOLITION PLAN - AREA C

ED1.1C

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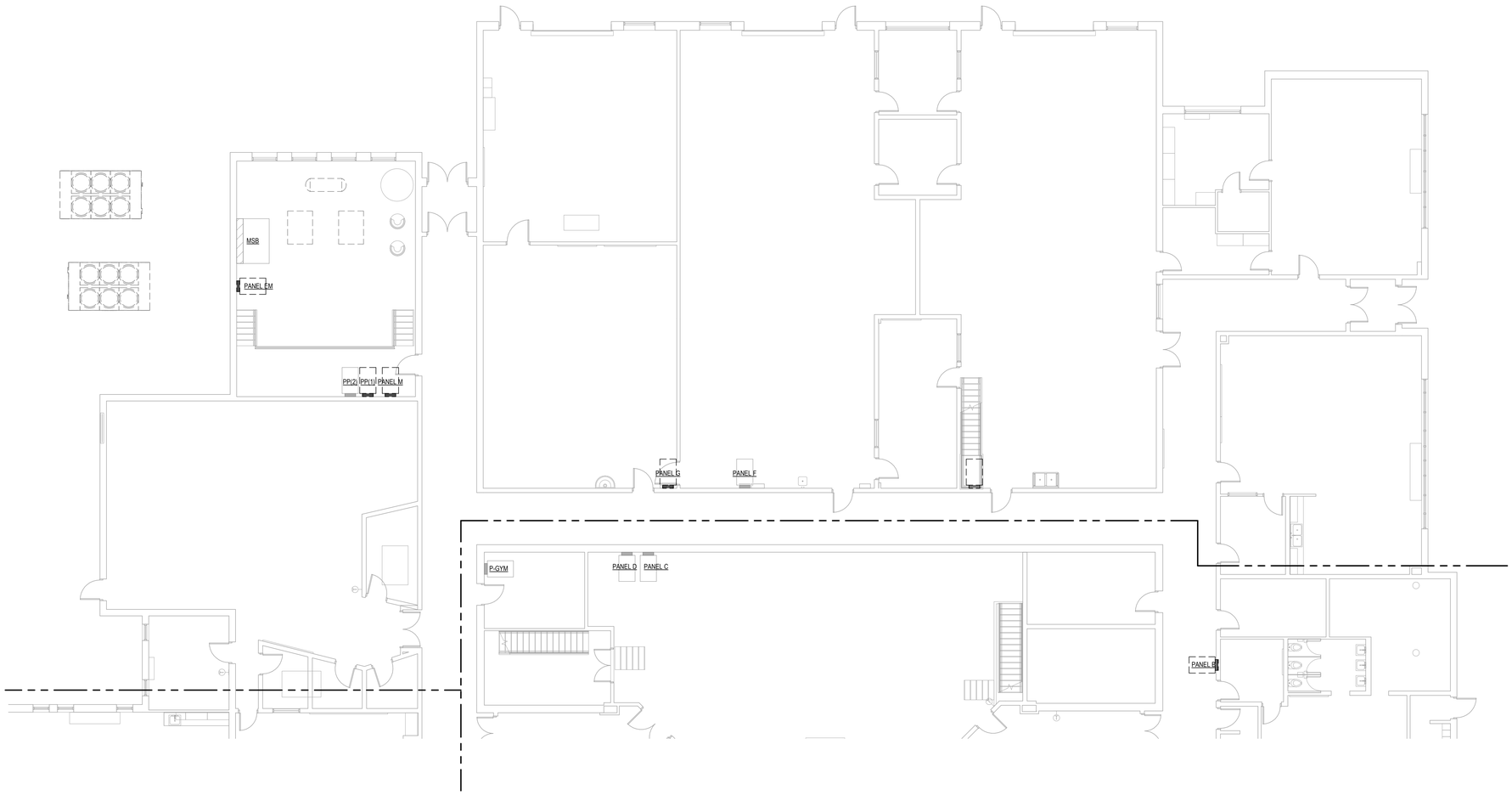

ELECTRICAL DEMOLITION PLAN - AREA D

NORTH

SCALE: 1/8" = 1'-0"

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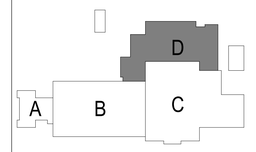
KEY PLAN



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ELECTRICAL DEMOLITION PLAN - AREA D

ED1.1D

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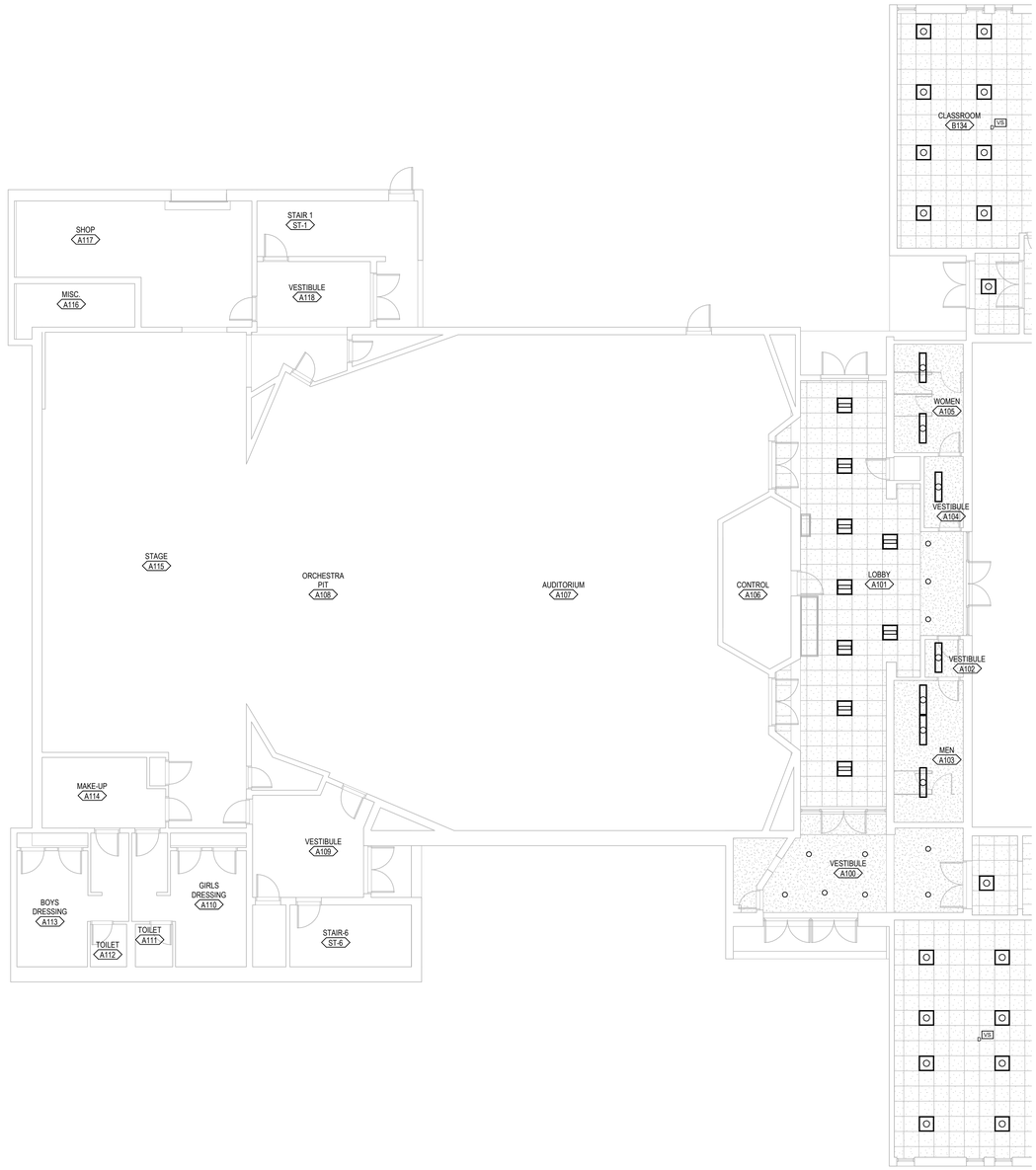
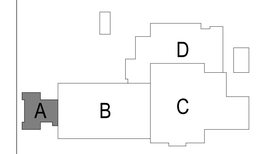


LIGHTING PLAN - AREA A

SCALE: 1/8" = 1'-0"

NORTH

KEY PLAN



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LIGHTING PLAN - AREA A

E1.1A

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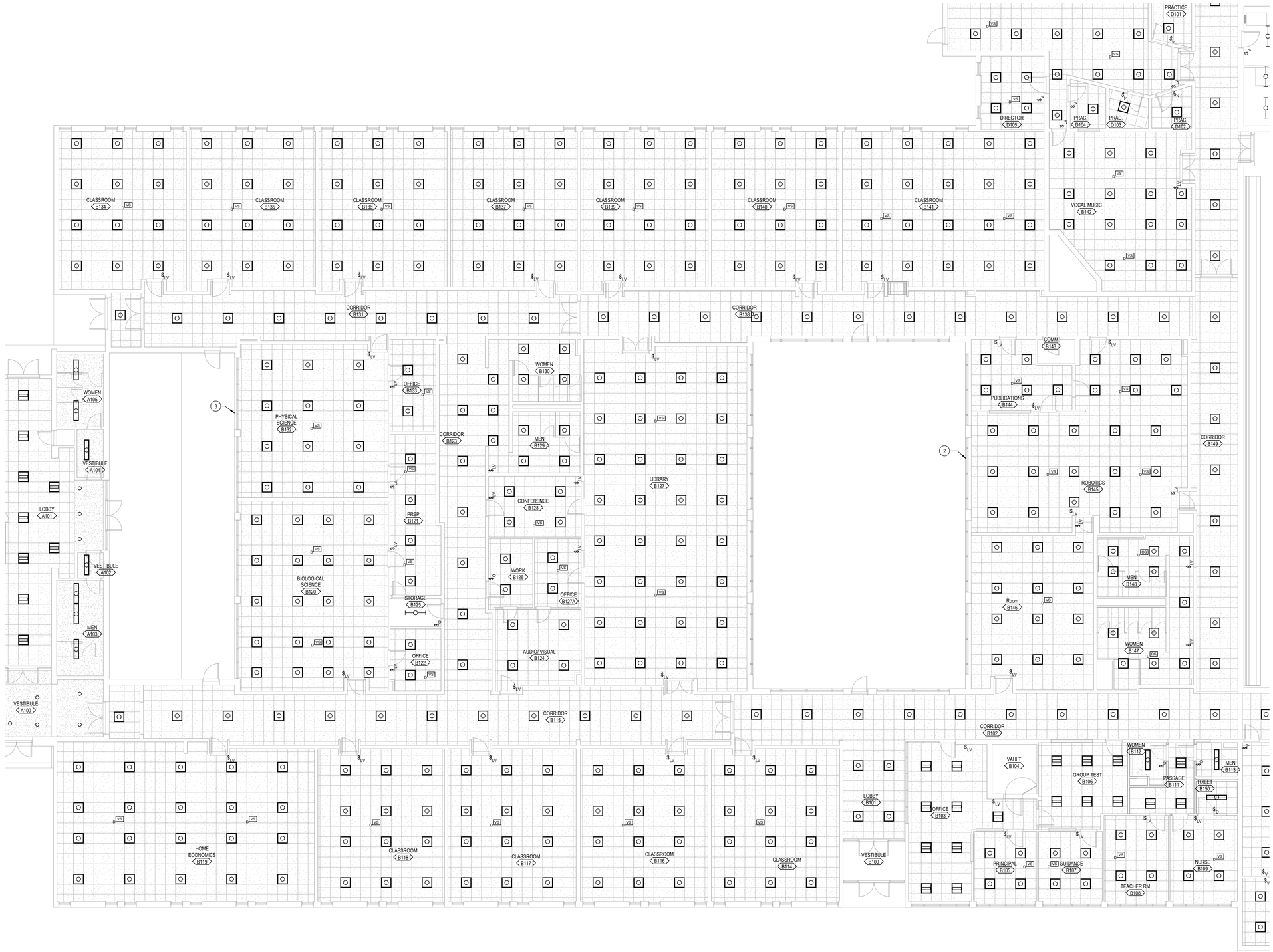
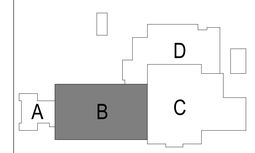


LIGHTING PLAN - AREA B

NORTH

SCALE: 1/8" = 1'-0"

KEY PLAN



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LIGHTING PLAN - AREA B

E1.1B

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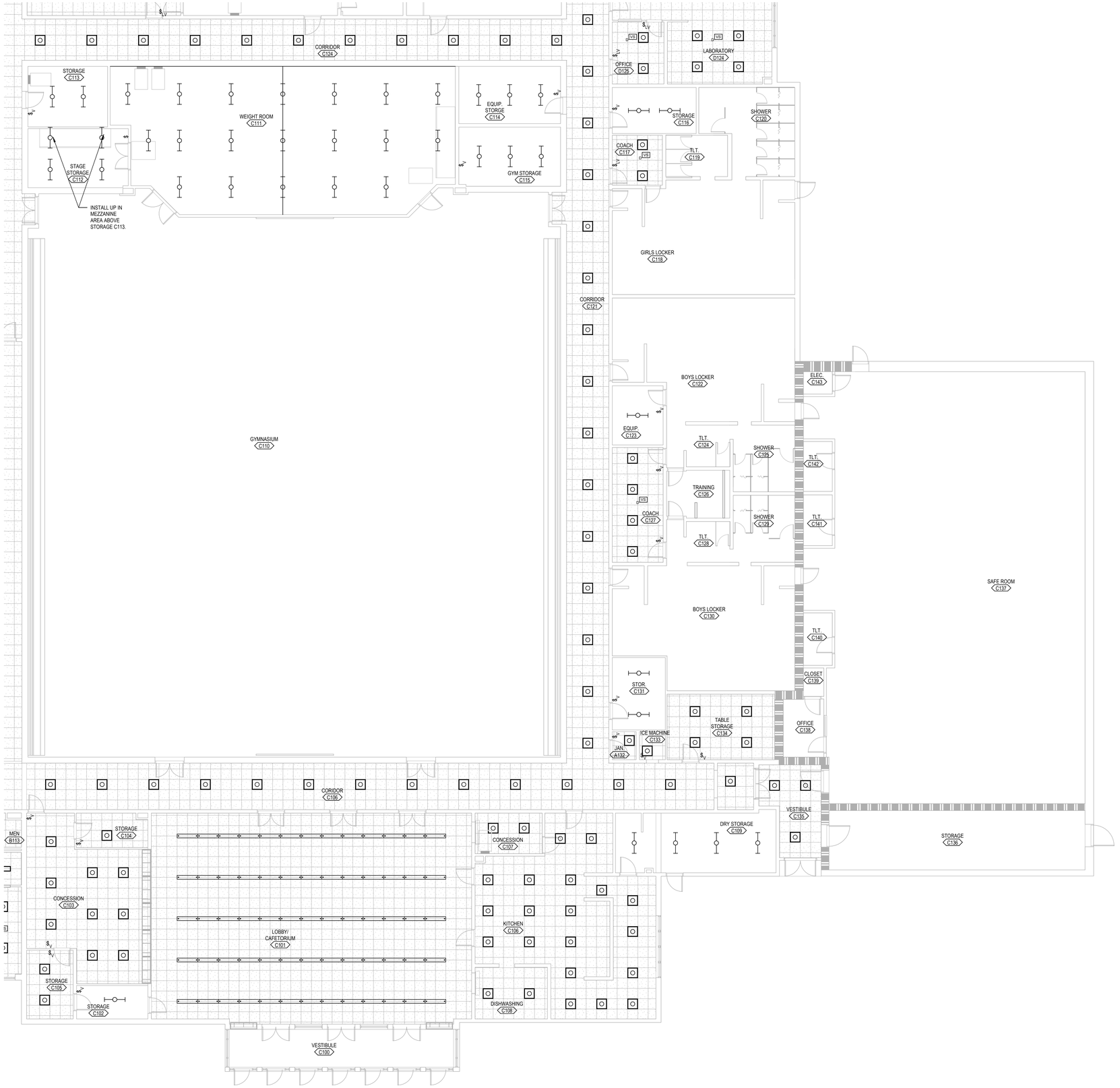

NORTH

LIGHTING PLAN - AREA C

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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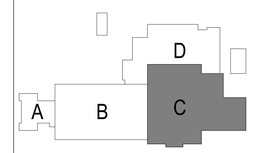

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LIGHTING PLAN - AREA C

E1.1C

NORTH

LIGHTING PLAN - AREA D

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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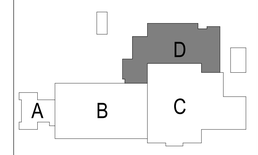

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LIGHTING PLAN - AREA D

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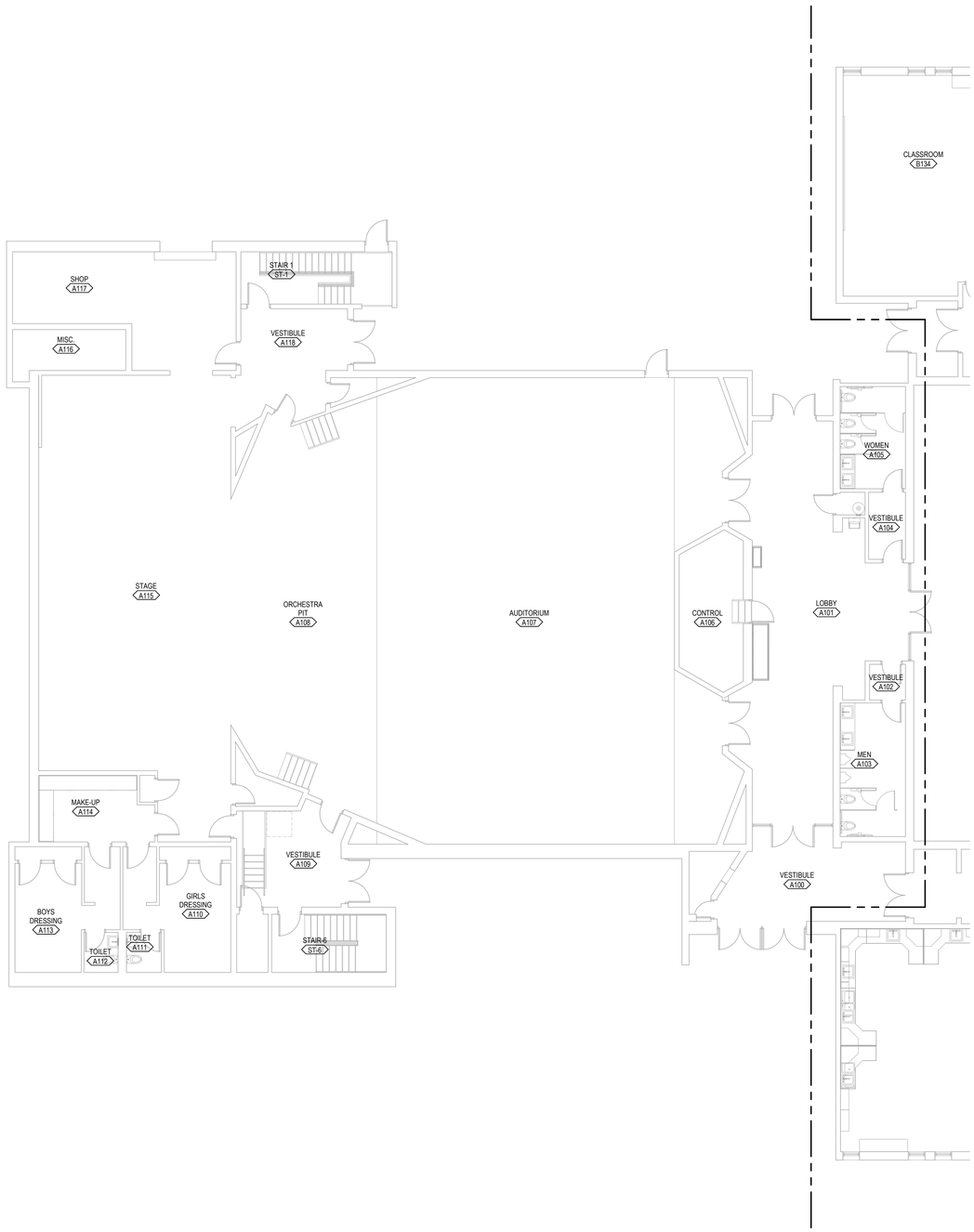

NORTH

POWER PLAN - AREA A

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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SHENANDOAH COMMUNITY SCHOOL DISTRICT

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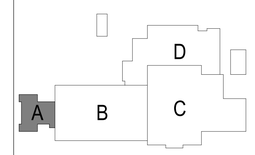

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POWER PLAN - AREA A

E2.1A

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LEGEND NOTES

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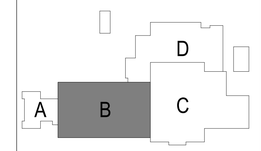
NORTH

POWER PLAN - AREA B

SCALE: 1/8" = 1'-0"

KEY PLAN



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POWER PLAN - AREA B

E2.1B

NORTH

POWER PLAN - AREA C

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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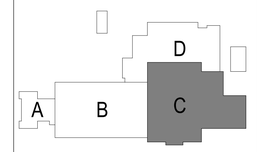

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POWER PLAN - AREA C

E2.1C

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LEGEND NOTES

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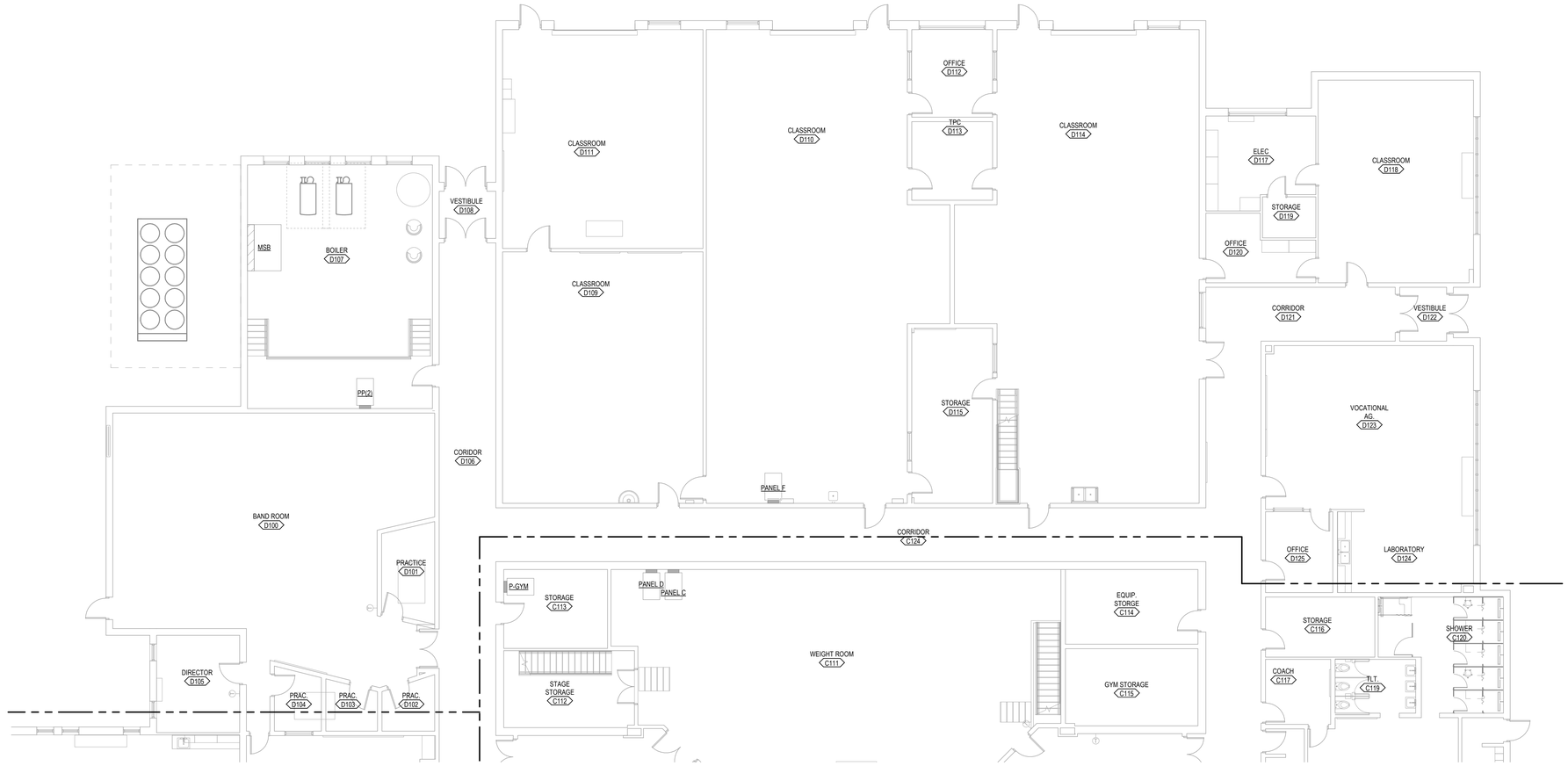
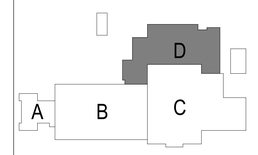


NORTH

POWER PLAN - AREA D

SCALE: 1/8" = 1'-0"

KEY PLAN



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POWER PLAN - AREA D

E2.1D

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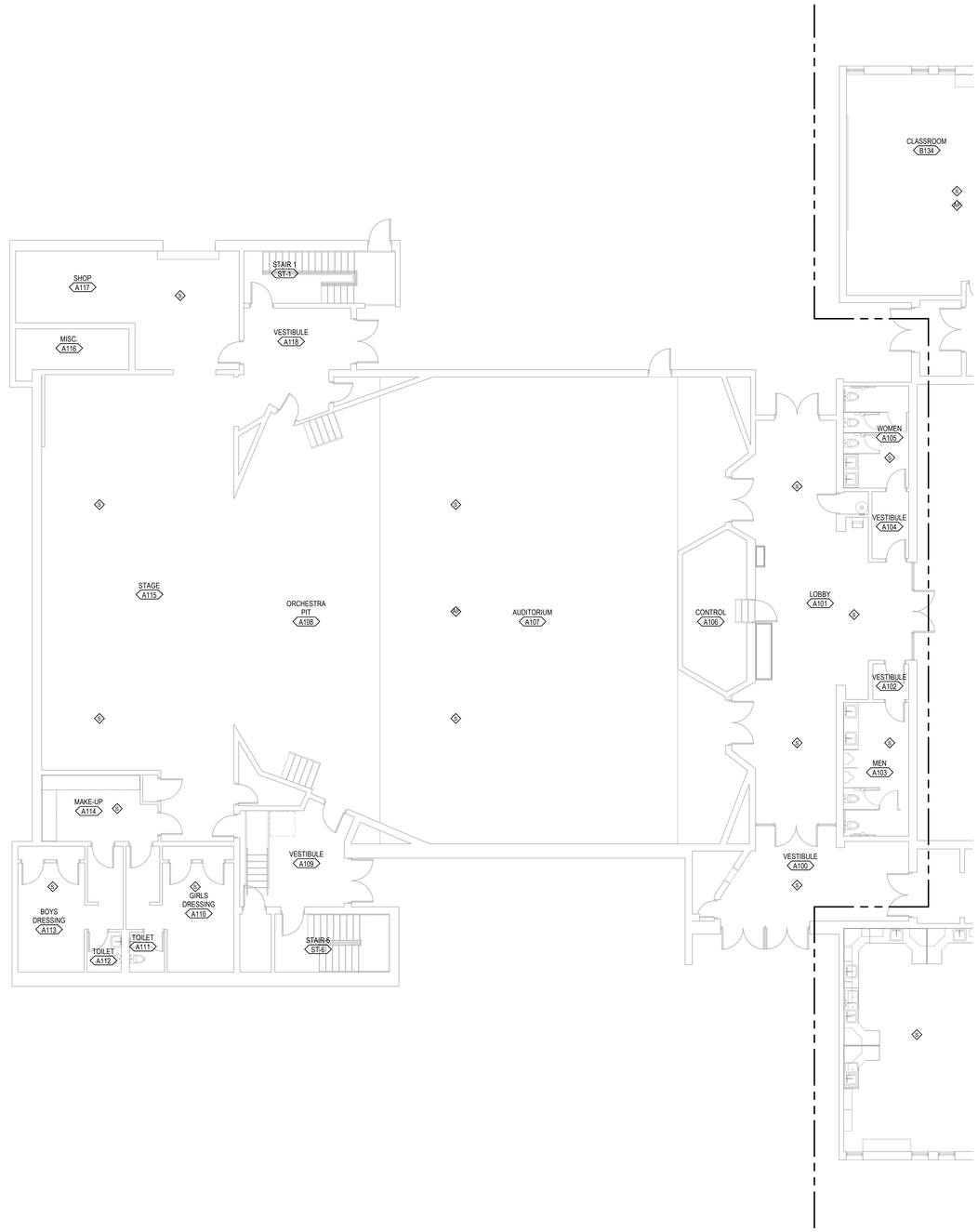

SPECIAL SYSTEMS PLAN - AREA A

SCALE: 1/8" = 1'-0"

NORTH

LEGEND NOTES

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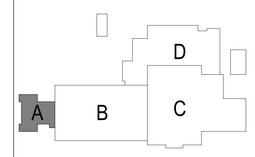
KEYED NOTES

1. WHERE CEILING STRUCTURE IS EXPOSED, PROVIDE SURFACE-MOUNT BACKBOX FOR SPEAKERS AND ATTACH TO SUPPORT CHANNEL SPANNING THE TOP CORDS OF TWO CEILING JOISTS.
2. PROVIDE COMPLETE DESIGN AND SELECTION FOR LOUDSPEAKER CLUSTER BY SYSTEM MFR / VENDOR FOR OPTIMUM INTELLIGIBILITY AND SOUND QUALITY. MOUNTING HEIGHT SHALL BE SUCH THAT THE BOTTOM OF EACH LOUDSPEAKER IS SLIGHTLY ABOVE THE BOTTOM CORD OF THE STRUCTURAL CEILING JOISTS. CONTRACTOR TO COORDINATE ALL INSTALLATION AND MOUNTING REQUIREMENTS PRIOR TO BIDDING. INCLUDE OVERALL CUSTOM WIREGUARD OR INDIVIDUAL LOUDSPEAKER WIREGUARD, UNLESS LOUDSPEAKERS ARE RATED IMPACT-RESISTANT.
3. WHERE CEILING STRUCTURE IS EXPOSED, MOUNT JUNCTION BOX SECURELY TO BOTTOM CORD OF STRUCTURAL CEILING JOIST. FOR OWNER-PROVIDED Wi-Fi ROUTER LOCATED IN THE GYMNASIUM, PROVIDE WIREGUARD - ALSO SECURELY FASTENED TO BOTTOM OF JOIST. COORDINATE WITH OWNER'S I.T. REPRESENTATIVE.

KEY PLAN



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- NOT FOR CONSTRUCTION -

SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT

09-25-19

Revisions

11-16116-20

SPECIAL SYSTEMS PLAN - AREA A

E3.1A

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LEGEND NOTES

NOT ALL LEGEND NOTES SHOWN HERE APPLY TO DRAWINGS ON THIS SHEET

KEYED NOTES

1. WHERE CEILING STRUCTURE IS EXPOSED, PROVIDE SURFACE-MOUNT BACKBOX FOR SPEAKERS AND ATTACH TO SUPPORT CHANNEL SPANNING THE TOP CORDS OF TWO CEILING JOISTS.
2. PROVIDE COMPLETE DESIGN AND SELECTION FOR LOUDSPEAKER CLUSTER BY SYSTEM MFR / VENDOR FOR OPTIMUM INTELLIGIBILITY AND SOUND QUALITY. MOUNTING HEIGHT SHALL BE SUCH THAT THE BOTTOM OF EACH LOUDSPEAKER IS SLIGHTLY ABOVE THE BOTTOM CORD OF THE STRUCTURAL CEILING JOISTS. CONTRACTOR TO COORDINATE ALL INSTALLATION AND MOUNTING REQUIREMENTS PRIOR TO BIDDING. INCLUDE OVERALL CUSTOM WIREGUARD OR INDIVIDUAL LOUDSPEAKER WIREGUARD, UNLESS LOUDSPEAKERS ARE RATED IMPACT-RESISTANT.
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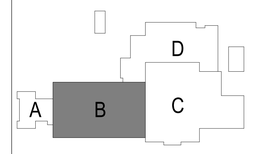
SPECIAL SYSTEMS PLAN - AREA B

NORTH

SCALE: 1/8" = 1'-0"

KEY PLAN



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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

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SPECIAL SYSTEMS PLAN - AREA B

E3.1B

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NORTH

SPECIAL SYSTEMS PLAN - AREA C

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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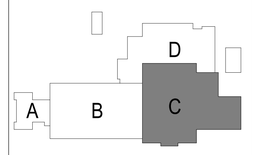

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SHENANDOAH COMMUNITY SCHOOL DISTRICT

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SPECIAL SYSTEMS PLAN - AREA C

E3.1C

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NORTH

SPECIAL SYSTEMS PLAN - AREA D

SCALE: 1/8" = 1'-0"

LEGEND NOTES

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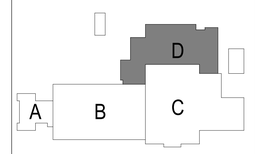

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SHENANDOAH HIGH SCHOOL RENOVATIONS

SHENANDOAH COMMUNITY SCHOOL DISTRICT

DESIGN DEVELOPMENT

09-25-19

Revisions

11-16116-20

SPECIAL SYSTEMS PLAN - AREA D

E3.1D

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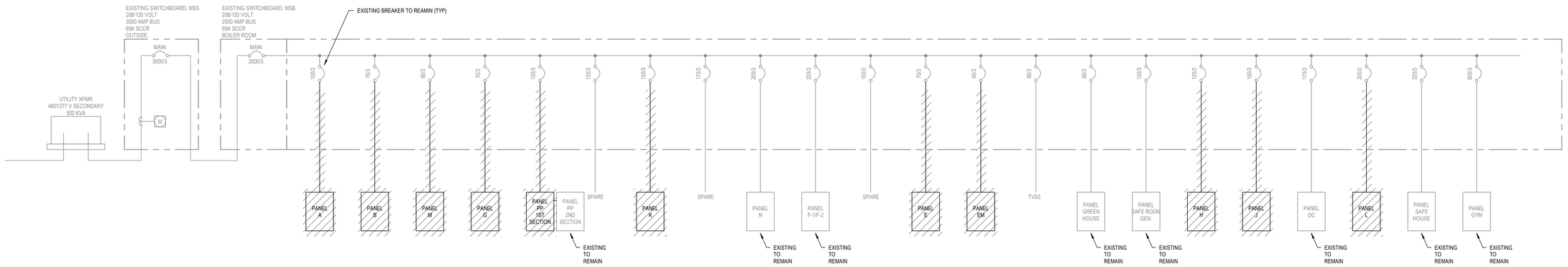
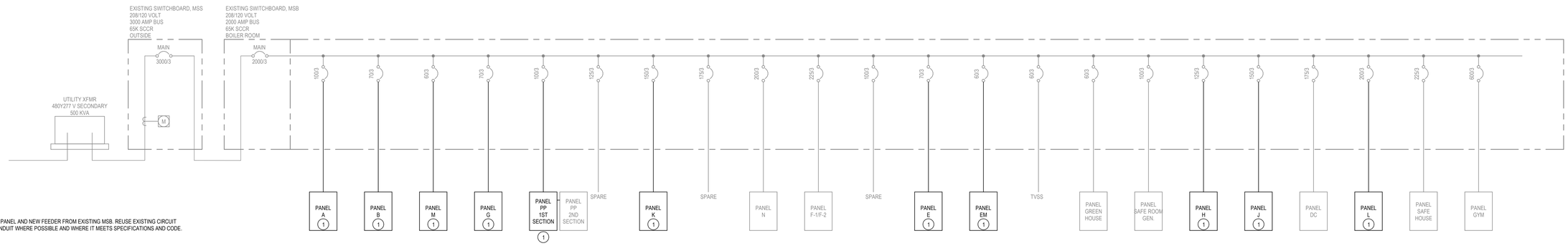


ONE-LINE DIAGRAM - DEMOLITION

SCALE: 12" = 1'-0"



KEYED NOTES

1. INSTALL NEW PANEL AND NEW FEEDER FROM EXISTING MSB. REUSE EXISTING CIRCUIT BREAKER AND CONDUIT WHERE POSSIBLE AND WHERE IT MEETS SPECIFICATIONS AND CODE.

1 / E4.1 ONE-LINE DIAGRAM - NEW

NO SCALE

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SHENANDOAH HIGH SCHOOL RENOVATIONS
SHENANDOAH COMMUNITY SCHOOL DISTRICT

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ELECTRICAL ONE-LINE DIAGRAM

E4.1

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Design Development Budget Report

Shenandoah Community School District

Shenandoah High School
Shenandoah, Iowa

October 8, 2019

Prepared by:

CARL A. NELSON & CO. NELSON

Building Solutions Since 1913

Cindy Larson, NCARB, Project Manager
Tim Seibert, P.E., Project Executive
Carl A. Nelson & Co.
1815 Des Moines Avenue
Burlington, IA 52601
(319) 754-8415

Table of Contents

BUDGET BASIS
The budgets contained herein are based on the following documents:

1. Design Development Project Submittal prepared by DLR Group and dated September 25, 2019.
2. Design Development Drawings all dated September 25, 2019 prepared by DLR Group as follows:
    a. General: 0.0 Cover Sheet, 0.1 Symbols and Abbreviations
    b. Civil: C0.1 Site Survey, C2.1 Site Layout Plan
    c. Architectural: CP0.1 Code Summary and Notes, CP1.1 Code Plan, AD1.1A-A1.1D Demolition Plan, A0.0 Interiors Material Schedule and Notes, A1.1A-A1.1D Floor Plan, A3.1A-A3.1D Reflected Ceiling Plan, A9.1 Door and Frame Schedule
    d. Mechanical: M0.1 Mechanical Symbols and Abbreviations, M1.1B-M1.1D HVAC Plan, M3.1 Enlarged HVAC Plans, M4.1 Mechanical Details, M5.1 Mechanical Schedules
    e. Plumbing: P2.1 Large Scale Plumbing Plans
    f. Electrical: E0.1 Electrical Symbols and Abbreviations, ED1.1A-ED1.1D Electrical Demolition Plan, E1.1A-E1.1D Lighting Plan, E2.1A-E2.1D Power Plan, E3.1A-E3.1D Special Systems Plan, E4.1 Electrical One-Line Diagram
3. Design development drawings are not intended to be complete. There were some scope items that were priced based on design meeting discussions and historic drawings, that did not show up in the design development drawings. See the following for clarity of what was included in the design development budget.
    a. Quantity and location of existing mechanical equipment for purposes of the HVAC controls replacement were based on historic drawings. The control equipment needs to be upgraded through-out the entire building due to the change in the HVAC network protocol to BACnet.
    b. Full design still needs to be developed in the "repurpose space" and segregated as part of the alternate. The following assumptions were made as part of the alternate and priced in the Renovation budget.
        i. All acoustical ceiling tile to be replaced.
        ii. Provide DOAS for science rooms.
        iii. Replace and add one emergency eyewash and shower in the science and preparation rooms.
        iv. Upgrade existing and added one fume hood in science rooms.
    c. Modify the historic stage area by lowering the floor and supporting the trophy case to create an accessible at-risk classroom. Storage C113, Equip Storage C114, and Gym Storage C115 or the rooms directly above them were missing from the reflected ceiling plans. New lights for these rooms were priced.
    d. Two new data/com closets will be created somewhere in the building.
    e. Concrete floors demolished and replaced in the four (4) new/modified restrooms to accommodate plumbing.
    f. Replace existing lights in the locker rooms with new LED lights.
    g. It was unclear which WIFI access points were reused and which were new. It was assumed all WIFI access points shown on the drawings are existing and by Owner. This needs to be clarified for the construction documents.

Based on the development level of the documents that are the basis of these budgets and the corresponding estimating techniques used to prepare the budgets, we would expect the actual bid

cost of the project would be within ±10% of these budgets. We have included a 10% design and estimating contingency in the budgets to accommodate this expected variation.

RENOVATION SCOPE

The existing school gross floor area is approximately 94,000 SF, but our renovation excludes the gym, wrestling (safe) room addition and the auditorium addition except for the auditorium lobby and auditorium restrooms. Therefore, the area that is being improved in the "Renovation" project is 63,400 sf. The "Renovation" project consists of four general types of work. **Items that have changed since Schematic Design are bolded;**

1. Upgrading the HVAC System
    a. **Removed all costs associated with the dedicated outdoor air systems (DOAS) that were intended to service the non-shop classroom portions of the building served by the unit ventilators. The unit ventilators will have the controls replaced and continue to supply fresh air to the rooms they serve.**
    b. New chillers, boilers and related pumps sized to replace equipment at the end of its useful life, sized for currently planned additions.
    c. Locker room DOAS system to improve ventilation in this portion of the building.
    d. Science Room DOAS system and new fume hoods to improve ventilation in this portion of the building.
    e. Modernize the HVAC control system in the building for improved control and maintenance.

2. Increasing Energy Efficiency/Improving Technology
    a. Removed all costs associated with furring out the exterior walls and insulating them.
    b. New LED lighting throughout the Renovation area, including controls for daylight harvesting and occupancy sensors.
    c. New data closets with dedicated HVAC.
    d. New data cables and switches, racks, data com room, and wiring to wireless access points but reusing recently installed wireless access points.
    e. Two new convenience receptacles in each classroom, **as well as, outlets in the hall by the benches, admin. restrooms, and historic stage area.**
    f. Replace intercom system.
    g. CO2 sensors to demand control ventilation instead of occupancy sensors associated with the lights.

3. Improving ADA Accessibility
    a. Replacing the existing inoperable platform lift in the auditorium with a new lift
    b. Demolishing the existing two (2) administrative restrooms and nurse restroom and creating three (3) accessible restrooms near the administration area. **The ceiling changed from a hard ceiling to acoustical ceiling tile and from tile on one wall to on all four walls. Floor drains were added.**
    c. Options for Site ADA accessibility were further developed. The updated drawings reduced number of ADA compliant ramps from two (2) to (1) from the parking lot to the school, added ramps to the Auditorium from the drive due to slope, and reworking the parking lot and drive paving for proper

slope and replacing the existing parking lot ramps with concrete stairs. See Item VE 9.

d. ADA compliant interior rooms signs throughout.
e. ADA compliant showers. See Item VE 11.
f. **Lowering the floor of the historic stage area to create an accessible at-risk classroom (part of the alternate).**

4. Safety and Esthetics
    a. Replace existing ceiling tile in classrooms and miscellaneous rooms with new ceiling tile. Ceiling grid to be reused.
        i. Kitchen ceiling tile is not replaced.
    b. New ceiling tile and grid in ~~**the corridors and**~~ the auditorium lobby, **new administration restrooms, room C127 and historic stage area.**
        i. Initially, only the Auditorium lobby ceiling tile was to have a high NRC rating for sound deadening. In the Design Development budget, all new ceiling tile has been upgraded to a high NRC rating.
        ii. See VE 8 for other ceiling tile options.
    c. Add emergency shower/eye wash stations in the existing science rooms.
    d. Parking lot lighting.
    e. Access control is needed at all of the doors to the auditorium vestibule (8 in all) which will be connected to the existing central district system with new door hardware added.
    f. Schematic design included updating the shower fixtures. This has now been removed from the scope and replaced with accessible showers. See item 3 above.

INDEPENDENT RENOVATION SCOPE
The "Independent Renovation" are projects that are independent of other work and as such can be completed independent of each other and of the main renovation project. See the Schematic Design Budget Report for a listing of the scope and budget included in the "Independent Renovation".

ADDITIONS AND STEM REPURPOSING UPDATE
The GYM addition and CTE addition and STEM repurposing scope will be funded by a General Obligation Bond. The community will vote on moving forward with the "Additions and STEM Repurposing" on November 5, 2019.

BUDGET DISCUSSION

The strategy is to design the Renovation scope for the entire building including spaces that potentially could be repurposed if the CTE building addition is built with the repurposed space work designated as an add Alternate in the construction documents. Once it is determined if the additions are funded, we will issue the "Renovation" construction documents for bidding either to include the alternate if funding is not available for the additions or exclude the alternate if the funding is available for the additions.

RENOVATION OVERALL BUDGET

Renovation (see page 9 for detail)	$4,871,143	
Independent Renovations	$1,388,530	
Total Renovation Budget		$6,259,673
Renovation Savings if Additions are Built		($382,475)
Total Renovation Budget if Additions are Built		$5,877,198

Overall, this design development budget is a reduction in total project cost of $78,773 from the 25% schematic budget. Some of the more significant items that changed the project cost are listed below.

Summary of major shifts in costs	**Additions**	**Reductions**
ADA access from parking lot	$325,336	
HVAC controls	$134,942	
Ceiling tile replacement with upgraded acoustical properties (see value engineering options)	$194,376	
Light fixtures		($187,914)
Feeders to new panel boards, and finishes repair	$73,107	
ADA showers – added scope	$261,172	
Lowering historic stage – added scope	$42,395	
Removing DOAS for classrooms		($467,460)
Removing exterior insulation		($286,900)
Reduced design and estimating contingency		($151,060)
Reduced architect and engineering fee		($73,755)

It is the intention of Carl A. Nelson & Company to create six bid packages for the Renovation project with the project going out to bid the end of December.

BP 1 General Construction
BP 2 Site Work
BP 3 Mechanical/Plumbing
BP 4 Controls
BP 5 Electrical
BP 6 Technology

VALUE ENGINEERING ITEMS

VE 1. Reuse the current unit ventilators for outdoor air. No DOAS system, no removal of ceiling grid. Still new ceiling tile everywhere.
This item has been accepted and is included in the budget with an approximate savings of $467,460.

VE 2. Reduce width of corridor at CTE or reinforce structure of existing building which will be studied in the design development phase.
Not reviewed, part of Phase II - Additions and STEM Repurposing project.

VE 3. Deleting the additional insulation in existing exterior walls will be studied in the energy efficiently evaluation.
This item has been accepted and is included in the budget with an approximate savings of $286,900.

VE 4. Cost of seed versus sod.
Not reviewed, part of Phase II - Additions and STEM Repurposing project.

VE 6. Skylights vs other options will be studied in the design development phase.
Not reviewed, part of Phase II - Additions and STEM Repurposing project.

VE 7. Emergency lights powered by generator instead of batteries, if capacity is available. Will be an add, but will save maintenance time. This will be studied in the design development phase.
No additional information was provided by the engineer for analysis, at Design Development, therefore, no budget analysis can be applied at this time.

VE 8. Ceiling tile options.
There is approximately 42,200 SF of ceiling tile.

Ceiling Tile Product	**Expected Savings**
Armstrong, Optima, tegular 15/16", 24" x 24" x 1"; Item #3354*****	$0.00
Armstrong, Ultima, square lay-in 15/16", 24" x 24" x 3/4"; Item #1900	($68,677)
Armstrong, Ultima, square lay-in 15/16", 24" x 24" x 3/4"; Item #1911A******	($108,740)
Armstrong, Ultima, tegular 15/16", 24" x 24" x 3/4"; Item #1951	($57,231)
Armstrong, Calla, square lay-in 15/16", 24" x 24" x 1"; Item #2820	($34,338)

* Product used in the budget
** CANCO suggested alternate. Difference between #1900 and #1911A is that #1911A does NOT pull VOC out of the air.

VE 9. ADA Exterior Ramp

There were two options designed for ADA access from ADA parking for the Auditorium.

Both options include the ramp from the drive to the auditorium, adjusted for proper ADA slope along with railings. The existing ramp from the parking lot to the drive will be replaced with concrete stairs.

Option A includes three handicapped parking stalls in the existing parking lot with the pavement removed and replaced for proper slope, a switch back ADA ramp up the hill and a portion of the drive pavement removed and replaced for proper ADA slope. Option A is included in the budget.

Option B includes three parking stalls off of the drive, connected to the auditorium by a sidewalk. Option B, if accepted, has an approximate savings of $87,453.

VE 10. Lighting Controls

The school district may want to explore a more simplified lighting controls system. The current budgeted system has occupancy sensors in the rooms, as well has a hard-wired full building lighting control system.

VE 11 Improve showers for ADA accessibility

The design team provided a solution to upgrade the existing locker room showers to be accessible, with a new floor slope for proper drainage, slip resistant flooring material and improve privacy by creating individual shower and dressing areas. The existing training room is renovated be ADA accessible and provide an ADA compliant toilet accessible from the locker rooms. New flooring is included in the restroom portions of the locker rooms. This work is included in the budget with an approximate cost of $261,172.

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Renovation Budget Detail

Code	Item	25% SD Budget	% of Con. Cost	DD Budget	% of Con. Cost	Notes
100	**Development Costs**	**$ 2,502**	**0%**	**$ 2,500**	**0%**	
101	Land	$ -		$ -		N/A
102	Utility Hook-up Fees	$ -		$ -		
103	State Building Permit	$ 1,602		$ 1,600		
104	Local Building Permit	$ 900		$ 900		
200	**Construction Cost**	**$ 4,192,538**	**100%**	**$ 4,187,555**	**100%**	
201	Site Grading, Utilities, Paving,	$ -		$ -		
202	Building Construction	$ 3,206,637		$ 3,348,409		
203	General Insurance	$ 18,919	0.59%	$ 19,756	0.59%	
204	Construction Manager Const. Fee	$ 88,703	2.75%	$ 92,625	2.75%	CANCO
205	Design & Estimating Contingency	$ 497,139	15%	$ 346,079	10%	of con. cost
206	Construction Contingency	$ 381,140	10%	$ 380,687	10%	of con. cost
300	**Professional Fees & Expenses**	**$ 696,403**	**17%**	**$ 622,618**	**15%**	
301	A/E Prebond Services Fee	$ 42,224		$ 42,224		DLR
302	CM Pre-bond Services Fee	$ 15,000		$ 15,000		CANCO
303	A/E Design incl CA Fee	$ 398,291	9.50%	$ 324,536	7.75%	DLR
304	Prepare SWPPP & NPDES Permit	$ -		$ -		DLR
305	Monitor & Document SWPPP	$ -		$ -		see #200
306	Arch/Eng. Reimbursable Expenses	$ 12,578	0.30%	$ 12,563	0.30%	DLR
307	Printing	$ 12,578	0.30%	$ 12,563	0.30%	TBD
308	CM Pre-Construction Services Fee	$ 55,000		$ 55,000		CANCO
309	Furniture and Equipment Consultant	$ -		$ -		District
310	Site Survey	$ 11,950		$ 11,950		Snyder
311	Geotechnical investigation & Report	$ 10,000		$ 10,000		TBD
312	Building Laser Scan	$ 33,339		$ 33,339		DLR
313	HVAC Retro-Commissioning Services	$ 12,444		$ 12,444		CANCO
314	Asbestos Survey & Testing	$ 5,000		$ 5,000		TBD
315	Mold Testing	$ 3,000		$ 3,000		TBD
316	3rd Party Special Inspections	$ 5,000		$ 5,000		TBD
317	Commissioning - IECC code minimum	$ 40,000		$ 40,000		TBD
318	Commissioning - Enhanced MEP	$ 40,000		$ 40,000		TBD
400	**Administrative & Legal**	**$ 12,474**	**0%**	**$ 12,471**	**0%**	
401	Legal Expense	$ 10,000		$ 10,000		
402	Administrative & Misc. Expense	$ -		$ -		None
403	Moving Expense	$ -		$ -		District
404	Builder's Risk Insurance	$ 2,474	0.06%	$ 2,471	0.06%	TBD
500	**Furniture, Fixtures, & Equip. (FFE)**	**$ -**	**0%**	**$ -**	**0%**	
501	Furniture	$ -		$ -		
502	Lab Casework	$ -		$ -		
503	Lab Equipment	$ -		$ -		Hoods #200
504	Shop Equipment	$ -		$ -		
505	Gym & Fitness Equipment	$ -		$ -		
506	FFE Contingency (15%)	$ -	15%	$ -	15%	

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Renovation Budget Detail

Code	Item	Budget	% of Con. Cost	Budget	% of Con. Cost	Notes
600	**Technology Systems**	**$ 46,000**	**1%**	**$ 46,000**	**1%**	
601	Network switches & fire wall	$ 40,000		$ 40,000		
602	Structured Cabling System	$ -		$ -		
603	Phone system	$ -		$ -		
604	A/V Equipment	$ -		$ -		
605	Access Control & Security Cameras	$ -		$ -		
606	Public Address/Intercom System	$ -		$ -		
607	Clocks	$ -		$ -		
608	Technology Contingency (15%)	$ 6,000	15%	$ 6,000	15%	
700	**Financing Expenses**	**$ -**	**N/A**	**$ -**		
701	Capitalized Interest During Const.	$ -		$ -		net funding
702	Bond Fees	$ -		$ -		net funding
	Total	**$ 4,949,916**	**118%**	**$ 4,871,143**	**116%**	