

# COUNTY OF MONTGOMERY

PURCHASING DEPARTMENT  
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## REQUEST FOR PROPOSAL, RFP # 16-08 ADDENDUM NUMBER 2

**DATE:** August 20, 2015  
**TITLE:** Purchase of the Old Blacksburg High School Property

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1. Attached are findings by OWPR and ATS International, Inc. after the collapse of the gym.
2. All other terms and conditions remain the same.
3. Due date remains October 1, 2015

ACKNOWLEDGE RECEIPT OF ADDENDUM # 2:

COMPANY/FIRM NAME AND ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Zip Code \_\_\_\_\_

SUBMITTED BY:

NAME: \_\_\_\_\_

(print)

SIGNATURE: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

Toll Free Number: ( ) \_\_\_\_\_ Telephone Number: ( ) \_\_\_\_\_ Fax Number: ( ) \_\_\_\_\_

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

**Action Codes and Colors:**

-  1 Remediation required prior to occupancy.
-  2 Remediate and monitor. Remediation not required prior to occupancy.
-  3 No remediation required. Monitor for additional movement or damage.
-  4 No action required.

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
<b>STRUCTURAL ASSESSMENT</b>				
181	A001	stair step/horizontal crack @ wall	building movement	3
181	A002	stair step/horizontal crack @ wall	building movement	3
181	A003	crack in concrete ceiling above	building movement	4
181	A004	crack in concrete ceiling above	building movement	4
181	A005	crack in concrete ceiling above	building movement	4
181	A006	crack @ door corner	building movement	3
189	A007	crack in concrete ceiling above	building movement	4
189	A008	crack in concrete ceiling above beside joist	building movement	3
189	A009	horizontal/stair step crack along wall	building movement	3
189	A010	horizontal/stair step crack along wall	building movement	4
189	A011	crack in ceiling above	building movement	4
189	A012	crack in CMU @ concrete beam	building movement	3
	A013	crack in ceiling above	building movement	3
190	A014 & A015	wall crack @ electrical box	building movement	3
190	A016	crack in ceiling above	building movement	4
172	A017	crack in ceiling above	building movement	4
172	A018	crack in ceiling above	building movement	3
172	A019	crack in ceiling full width of room near beam	building movement	4
173	A020	crack in CMU wall, corner	building movement	3
173	A021	crack in ceiling above through several joist spaces	building movement	3
173	A022	crack in ceiling above through several joist spaces	building movement	3
174	A023	crack in CMU wall, corner	building movement	4
174	A024	multiple ceiling cracks diagonal across ceiling	building movement	3
175	A025	crack in CMU wall under duct	building movement	3
173	A026	crack in ceiling, diagonal	building movement	4
173	A027	crack in ceiling parallel to joist	building movement	4
173	A028	crack in ceiling parallel to joist	building movement	3
178	A029	crack in CMU wall below electrical panel	building movement	4
171	A030	stair step crack @ corridor wall - repaired	building movement	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
169	A031	opposite side of 171	building movement	3
169	A032	floor settlement - all along east end of room	building movement	3
169	A033	crack in CMU wall, corner	building movement	3
165	A034	crack in CMU wall behind white board	building movement	3
161	A035	crack in CMU wall, corner	building movement	4
161	A036	crack in CMU wall @ white board	building movement	3
164	A037	crack in CMU wall above door	building movement	3
164	A038	crack in CMU wall above door	building movement	3
167	A039	crack in CMU wall	building movement	3
168	A040	crack in CMU wall, corner	building movement	3
168	A041	crack in CMU wall at column	building movement	3
168	A042	crack in ceiling above - parallel to joist	building movement	3
204	A043	crack in concrete wall	building movement	3
152	A044	crack in CMU wall, corner	building movement	3
145	A045	crack in CMU wall above sink	building movement	4
145	A046	crack in CMU wall, corner	building movement	4
146	A047	crack in CMU wall at door corner	building movement	3
146	A048	crack in CMU wall, horizontal	building movement	3
146	A049	crack in CMU wall, corner	building movement	2
145	A050	crack in CMU wall, opposite #48	building movement	3
145	A051	crack in CMU wall, corner	building movement	3
145	A052	crack in CMU wall	building movement	3
144	A053	crack in CMU wall at bulletin board	building movement	3
141	A054	crack in CMU wall	building movement	3
143	A055	crack in CMU wall at window	building movement	3
143	A056	crack in CMU wall below duct	building movement	3
143	A057	hairline crack in ceiling	building movement	4
142	A058	crack in CMU wall, opposite #54	building movement	3
142	A059	crack in CMU wall @ sink	building movement	3
140	A060	crack in CMU wall above door	building movement	3
140	A061	crack in CMU wall above window	building movement	3
149	A062	crack in CMU wall, corner	building movement	3
147	A063	crack in CMU wall above door	building movement	4
147	A064	crack in CMU wall above door	building movement	4
209	A065	crack in CMU wall above door	building movement	4
209	A066	crack in CMU wall beside door	building movement	4
138	A067	crack in CMU wall, corner	building movement	3
138	A068	crack in CMU wall, corner	building movement	4
227	A069	crack in concrete ceiling	building movement	3
227	A070	crack in concrete ceiling	building movement	3
226	A071	crack in CMU wall above door	building movement	4
226	A072	crack in CMU wall above door	building movement	4

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
228	A073	crack in CMU wall above door	building movement	4
123	A074	crack in CMU wall above door	building movement	3
124	A075	crack in CMU wall above door	building movement	4
124	A076	crack in CMU wall	building movement	3
124	A077	crack in CMU wall, column	building movement	3
124	A078	crack in CMU wall, corner	building movement	4
124	A079	crack in CMU wall	building movement	3
137	A080	crack in CMU wall, opposite #79	building movement	3
137	A081	crack in CMU wall	building movement	3
134	A082	cracks in CMU wall	building movement	3
134	A083	cracks in CMU wall	building movement	3
134	A084	crack in concrete ceiling parallel to joists	building movement	3
125/124	A085	crack in CMU wall	building movement	3
133	A086	crack in CMU wall, opposite #83	building movement	3
132	A087	crack in CMU wall, corner	building movement	3
132	A088	crack in CMU wall, horizontal	building movement	4
132	A089	crack in CMU wall, corner	building movement	4
125	A090	crack in CMU wall, corner	building movement	3
125	A091	crack in CMU wall	building movement	3
125	A092	crack in CMU wall, corner	building movement	3
125	A093	crack in CMU wall, horizontal	building movement	3
130	A094	crack in CMU wall, corner	building movement	4
124	A095	crack in CMU wall, repaired	building movement	3
123	A096	crack in CMU wall, above door	building movement	3
123	A097	crack in CMU wall, above door	building movement	3
123	A098	crack in CMU wall, above door	building movement	4
123	A099	crack in CMU wall, above door	building movement	3
123	A100	crack in CMU wall	building movement	4
123	A101	crack in CMU wall, above door	building movement	3
123	A102	crack in CMU wall	building movement	4
123	A103	crack in CMU wall, above door	building movement	3
123	A104	crack in CMU wall, above door	building movement	4
123	A105	crack in CMU wall, above door	building movement	3
123	A106	crack in CMU wall	building movement	4
123	A107	crack in CMU wall, above door	building movement	3
123	A108	crack in CMU wall, horizontal	building movement	4
123	A109	crack in CMU wall, above door	building movement	3
122	A110	crack in CMU wall, corner	building movement	4
122	A111	crack in CMU wall, corner	building movement	3
122	A112	crack in CMU wall	building movement	3
122	A113	crack in CMU wall, corner	building movement	3
122	A114	crack in CMU wall, horizontal	building movement	4
122	A115	crack in CMU wall, above door	building movement	3
110	A116	crack in CMU wall, corner	building movement	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
110	A117	crack in CMU wall, horizontal	building movement	4
111	A118	crack in CMU wall, above door	building movement	3
111	A119	crack in CMU wall, door	building movement	3
111	A120	crack in CMU wall, corner	building movement	3
111	A121	crack in CMU wall	building movement	3
111	A122	crack in CMU wall	building movement	3
111	A123	crack in CMU wall, corner	building movement	3
111	A124	crack in CMU wall	building movement	3
113	A125	crack in CMU wall, corner & ceiling	building movement	3
115	A126	crack in CMU wall, corner	building movement	3
115	A127	crack in CMU wall, above door	building movement	3
115	A128	crack in CMU wall, above door	building movement	3
115	A129	crack in CMU wall, above door	building movement	3
115	A130	crack in CMU wall, corner	building movement	3
115	A131	crack in CMU wall, corner	deflection of framing above	3
115	A132	crack in CMU wall, corner	building movement	3
115	A133	crack in CMU wall	building movement	3
115	A134	vertical crack through beam and into wall below	building movement	3
115	A135	crack in CMU wall, above louver	building movement	3
115	A136	crack in CMU wall, above louver	building movement	3
115	A137	crack in CMU wall, horizontal	building movement	3
115	A138	steel frame in Mech. Rm. - settled	slab settlement - not certain of purpose of steel frame - no problem to address	4
115	A139	steel frame in Mech. Rm. - settled	slab settlement - not certain of purpose of steel frame - no problem to address	4
115	A140	steel frame in Mech. Rm. - settled	slab settlement - not certain of purpose of steel frame - no problem to address	4
115	A141	crack in CMU wall, corner	building movement	3
115	A142	crack in CMU wall	building movement	3
115	A143	crack in CMU wall	building movement	3
115	A144	crack in CMU wall	building movement	3
115	A145	crack in CMU wall	building movement	2
115	A146	crack in CMU wall	building movement	2
115	A147	crack in CMU wall	building movement	2
115	A148	crack in CMU wall, corner	building movement	2
115	A149	crack in CMU wall	building movement	2
115	A150	crack in CMU wall	building movement	3
115	A151	crack in CMU wall	building movement	3
115	A152	crack in CMU wall	building movement	3
115	A153	crack in CMU wall	building movement	3
115	A154	crack in CMU wall, above door	building movement	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
115	A155	crack in CMU wall, corner	building movement	3
115	A156	crack in CMU wall	building movement	3
116	A157	crack in CMU wall, corner	building movement	3
116	A158	crack in CMU wall	building movement	3
116	A159	crack in CMU wall, corner	building movement	3
116	A160	crack in CMU wall, corner	building movement	3
117	A161	crack in CMU wall	building movement	3
117	A162	crack in CMU wall, above door	building movement	3
117	A163	crack in CMU wall	building movement	3
117	A164	crack in CMU wall	building movement	3
117	A165	cracks in CMU wall	building movement	3
104	A166	crack in CMU wall, corner	building movement	3
104	A167	cracks in CMU wall	building movement	3
105	A168	crack in CMU wall	building movement	3
105	A169	crack in CMU wall	building movement	3
234	A170	crack in CMU wall	building movement	3
235	A171	crack in CMU wall	building movement	3
235	A172	crack in CMU wall, corner	building movement	3
235	A173	crack in CMU wall	building movement	3
101	A174	crack in brick wall above lockers	building movement	3
236	A175	expansion joint @ column, F0	no issue here - expansion joint properly functioning	4
236	A176	expansion joint @ column, F0	no issue here - expansion joint properly functioning	4
236	A177	crack concrete beam	building movement	2
236	A178	crack in concrete ceiling	building movement	3
238	A179	crack in CMU wall, over door	building movement	3
238	A180	crack in CMU wall, beside door	building movement	3
238	A181	crack in CMU wall	building movement	3
238	A182	crack in CMU wall	building movement	4
238	A183	crack in CMU wall, corner	building movement	3
238	A184	crack in CMU wall, near door	building movement	3
240	A185	crack in CMU wall, opposite #183	building movement	3
240	A186	crack in CMU wall, corner	building movement	3
241	A187	crack in CMU wall, corner	building movement	4
242	A188	crack in CMU wall, above door	building movement	3
242	A189	crack in CMU wall, above door	building movement	3
242	A190	crack in CMU wall	building movement	3
242	A191	crack in CMU wall, corner	building movement	3
266	A192	crack in CMU wall	building movement	3
266	A193	crack in CMU wall, above door	building movement	3
246	A194	crack in CMU wall, corner	building movement	3
246	A195	crack in CMU wall	building movement	4
252	A196	crack in CMU wall, corner	building movement	4
252	A197	crack in CMU wall, corner	building movement	4

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
246	A198	crack in CMU wall, corner & column	building movement	3
246	A199	crack in CMU wall, corner & column	building movement	3
246	A200	crack in CMU wall, corner & column	building movement	3
253	A201	crack in CMU wall, corner & column	building movement	3
253	A202	crack in CMU wall	building movement	3
253	A203	crack in CMU wall	building movement	3
253	A204	crack in CMU wall	building movement	3
661	A205	crack in CMU wall	building movement	3
661	A206	crack in CMU wall at ladder	building movement	3
660	A207	crack in CMU wall	deflection of supporting members	3
660	A208	crack in CMU wall	deflection of supporting members	3
660	A209	crack in concrete roof	deflection of supporting members	3
253	A210	crack in CMU wall	building movement	3
258	A211	crack in CMU wall	building movement	3
258	A212	crack in CMU wall	building movement	3
258	A213	crack in CMU wall, corner	building movement	4
264	A214	crack in CMU wall	building movement	3
264	A215	crack in CMU wall	building movement	3
265	A216	crack in CMU wall, corner	building movement	3
265	A217	crack in CMU wall, corner	building movement	3
265	A218	crack in CMU wall, corner	building movement	3
265	A219	crack in CMU wall, corner	building movement	3
277	A220	crack in CMU wall	building movement	3
277	A221	crack in CMU wall above door	building movement	3
277	A222	crack in CMU wall, corner	building movement	3
278	A223	crack in CMU wall, corner	building movement	3
278	A224	crack in CMU wall	building movement	3
278	A225	crack in CMU wall	building movement	3
283	A226	crack in CMU wall	building movement	3
283	A227	crack in CMU wall, corner	building movement	3
285	A228	wood framing above ceiling	deflection of roof framing	3
289	A229	crack in CMU wall	building movement	3
289	A230	crack in CMU wall	building movement	3
290	A231	crack in CMU wall	building movement	3
290	A232	crack in CMU wall, corner	building movement	3
290	A233	crack in CMU wall	building movement	3
290	A234	crack in CMU wall, corner	building movement	3
291	A235	crack in CMU wall, corner	building movement	3
291	A236	crack in CMU wall, above ceiling	building movement	3
291	A237	cracks in CMU wall	building movement	3
291	A238	crack in CMU wall	building movement	3
291	A239	crack in CMU wall, corner	building movement	3
291	A240	crack in CMU wall	building movement	3
291	A241	crack in CMU wall	building movement	3
291	A242	crack in CMU wall	building movement	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
291	A243	crack in CMU wall	building movement	3
292	A244	crack in CMU wall, corner	building movement	3
292	A245	crack in CMU wall	building movement	3
292	A246	crack in CMU wall	building movement	3
293	A247	cracks in CMU wall	building movement	3
293	A248	crack in CMU wall, corner	building movement	3
294	A249	crack in CMU wall, corner & door head	building movement	3
294	A250	crack in CMU wall, corner	building movement	3
294	A251	crack in CMU wall, above door	building movement	3
285	A252	crack in CMU wall, corner	building movement	3
Extr.	A253	cracked & spalled concrete; col. I12	building movement	1
Extr.	A254	cracked & spalled concrete; col. I12	building movement	1
Extr.	A255	crack in brick crack @ louver	building movement	3
Extr.	A256	cracked & spalled concrete; col. I12	building movement	1
Extr.	A257	cracked column, H12	building movement	1
Extr.	A258	cold joint in concrete column, H12	building movement	3
Extr.	A259	crack in brick wall & concrete band beam	building movement	2
Extr.	A260	cracked column, H13	building movement	1
Extr.	A261	cracked column, H13	building movement	1
Extr.	A262	cracked column, I13	building movement	1
Extr.	A263	cracked & spalled concrete; col. I13	building movement	1
Extr.	A264	cracked & spalled concrete; col. I13	building movement	1
Extr.	A265	Cracked column, I14	building movement	1
Extr.	A266	Cracked column, I14	building movement	1
143	A267	vertical crack in spandrel beam	building movement	3
146	A268	vertical crack where beams meet	building movement	2
146	A269	vertical crack where beams meet	building movement	2
168	A270	cracks in concrete beam	building movement	3
168	A271	cracks in concrete beam	building movement	3
168	A272	cracks in concrete beam	building movement	3
159	A273	expansion joint with movement	building movement	3
159	A274	expansion joint with movement	building movement	3
Extr.	A275	cracked concrete pad, exterior	building movement	4
Extr.	A276	cracked concrete pad, exterior	building movement	4
Extr.	A277	cracked column, I17	building movement	1
Extr.	A278	cracked & spalled concrete; col. I18	building movement	1
Extr.	A279	cracked column, I20	building movement	1
Extr.	A280	cracked column, I20	building movement	1
Extr.	A281	cracked column, I20	building movement	1
Extr.	A282	cracked column, I20	building movement	1
Extr.	A283	cracked & spalled concrete; col. H20	building movement	1
Extr.	A284	cracked & spalled concrete; col. H20	building movement	1
Extr.	A285	cracked concrete beam	building movement	2

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
Extr.	A286	brick corner outside door	building movement	2
Extr.	A287	crack in brick wall, corner	building movement	2
Extr.	A288	crack in brick wall, corner	brick expansion	2
Extr.	A289	crack in brick wall	building movement	2
Extr.	A290	crack in brick wall & loose brick	building movement	2
Extr.	A291	crack in brick wall	building movement	2
Extr.	A292	crack in brick wall	building movement	2
Extr.	A293	cracked column; F13	building movement	1
Extr.	A294	crack in brick wall	building movement	3
Extr.	A295	open expansion joint	building movement	3
Extr.	A296	open expansion joint	building movement	3
Extr.	A297	open expansion joint	building movement	3
Extr.	A298	cracked column, F12	building movement	1
510	A299	crack in CMU wall	building movement	3
Extr.	A300	crack in brick wall & loose brick	building movement	2
Extr.	A301	cracked column; B12	building movement	1
Extr.	A302	cracked column; A12	building movement	1
Extr.	A303	cracked column; A12	building movement	1
Extr.	A304	cracked column; A8	building movement	1
Extr.	A305	cracked column; A7	building movement	1
Extr.	A306	cracked column; A6	building movement	1
Extr.	A307	cracked column; A4	building movement	1
Extr.	A308	cracked column; A3	building movement	1
Extr.	A309	brick beside window	building movement	2
Extr.	A310	cracked column; A2	building movement	1
Extr.	A311	cracked column; A2	building movement	1
Extr.	A312	cracked column; B2	building movement	1
Extr.	A313	cracked column; C2	building movement	1
Extr.	A314	crack in brick wall	building movement	2
Extr.	A315	cracked column; D2	building movement	1
Extr.	A316	crack in concrete beam	building movement	2
Extr.	A317	crack in brick wall	building movement	3
Extr.	A318	crack in brick wall, corner	building movement	2
Extr.	A319	crack in brick wall, corner	brick expansion	2
Extr.	A320	crack in brick wall	building movement	2
Extr.	A321	crack in brick wall	building movement	2
Extr.	A322	crack in brick wall	building movement	3
Extr.	A323	crack in brick wall	building movement	2
Extr.	A324	crack in brick wall & loose brick	building movement	1
Extr.	A325	crack in brick wall	building movement	2
Extr.	A326	cracked concrete beam	building movement	2
Extr.	A327	crack in brick wall, repaired	building movement	3
Extr.	A328	crack in brick wall	building movement	3
Extr.	A329	crack in brick wall, corner	building movement	3
Extr.	A330	crack in brick pilaster	building movement	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
Extr.	A331	crack in brick wall	building movement	3
Extr.	A332	crack in brick wall, partially repaired	building movement	2
Extr.	A333	crack in brick wall, partially repaired	building movement	2
Extr.	A334	crack in brick wall, partially repaired	building movement	2
Extr.	A335	crack in brick wall	building movement	3
Extr.	A336	crack in brick wall	building movement	3
Extr.	A337	crack in brick wall	building movement	2
Extr.	A338	crack in brick wall & loose brick	building movement	1
Extr.	A339	crack in brick wall & loose brick	building movement	1
Extr.	A340	crack in brick wall & hole in wall	building movement	2
Extr.	A341	crack in brick wall & hole in wall	building movement	2
Extr.	A342	displaced brick	building movement	3
Extr.	A343	crack in brick wall	building movement	2
Extr.	A344	crack in brick wall	building movement	2
Extr.	A345	crack in brick wall, corner	building movement	2
Extr.	A346	crack in brick wall	building movement	2
Extr.	A347	crack in brick wall	building movement	2
Extr.	A348	crack in brick wall	building movement	2
101	B001	cracked CMU column	building movement	1
101	B002	cracked CMU column	building movement	1
101	B003	floor irregularity	building movement	3
300	B004	crack in CMU wall, repaired	building movement	4
295	B005	crack in CMU wall	building movement	2
295	B006	crack in CMU wall	building movement	2
296	B007	crack in CMU wall, horiz.	building movement	3
296	B008	crack in CMU wall	building movement	3
243	B009	crack in brick wall, horiz.	building movement	3
243	B010	crack in brick wall	building movement	3
243	B011	crack in CMU wall	building movement	4
297	B012	plaster ceiling damage	water leakage	3
297	B013	plaster ceiling damage	water leakage	3
298	B014	plaster ceiling damage	water leakage	3
299	B015	plaster ceiling damage	water leakage	3
243	B016	crack in CMU wall	building movement	4
285	B017	wood partition above clg	building movement	3
285	B018	wood partition above clg	building movement	3
401	B019	loose expansion joint cover	collateral damage from gym	1
401	B020	crack in CMU wall	building movement	2
401	B021	crack in CMU wall	building movement	3
650	B022	exposed rebar	construction defect	1
655	B023	crack in CMU wall	building movement	3
655	B024	crack in CMU wall	building movement	4
655	B025	crack in CMU wall	building movement	2
663	B026	displaced CMU	collateral damage from gym	1

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
663	B027	breech in wall, damaged column	collateral damage from gym	1
663	B028	broken gypsum wall board	collateral damage from gym	1
665	B029	breech in wall, damaged column	collateral damage from gym	1
665	B030	crack in CMU wall	building movement	3
665	B031	crack in CMU wall	building movement	3
667	B032	crack in CMU wall, corner	building movement	3
668	B033	breech in wall	collateral damage from gym	1
656	B034	crack in CMU wall	building movement	3
656	B035	crack in CMU wall	building movement	3
701	B036	crack in CMU wall, corner	building movement	4
702	B037	crack in CMU wall	building movement	2
702	B038	crack in CMU wall, corner	building movement	4
702	B039	crack in CMU wall	building movement	2
702	B040	crack in CMU wall	building movement	2
701	B041	crack in CMU wall, corner	building movement	4
700	B042	crack in CMU wall	building movement	4
659	B043	crack in CMU wall, corner	building movement	4
659	B044	crack in CMU wall, corner	building movement	4
659	B045	crack in CMU wall, corner	building movement	4
659	B046	crack in CMU wall	building movement	3
659	B047	crack in CMU wall, corner	building movement	4
658	B048	crack in CMU wall	building movement	3
651.1	B049	crack in CMU wall, horiz.	building movement	3
651	B050	crack in CMU wall	building movement	3
651	B051	crack in CMU wall, repaired	building movement	4
649	B052	crack in CMU wall, repaired	building movement	3
649	B053	crack in CMU wall, repaired	building movement	3
649	B054	crack in CMU wall, corner	building movement	3
630	B055	crack in CMU wall, repaired	building movement	3
630	B056	crack, displacement in CMU wall	building movement	3
647	B057	crack in CMU wall, horiz.	building movement	2
646	B058	crack in CMU wall, horiz.	building movement	2
638	B059	crack in CMU wall	building movement	4
635	B060	crack in CMU wall	building movement	2
635	B061	crack in CMU wall	building movement	2
636	B062	crack in CMU wall	building movement	2
635	B063	crack in CMU wall	building movement	2
605	B064	crack in brick wall	building movement	3
604	B065	crack in brick wall	building movement	2
606	B066	crack in brick wall	building movement	2
609	B067	crack in CMU wall, corner	building movement	3
609	B068	crack in CMU wall at column	building movement	2
625	B069	crack in CMU wall	building movement	4
623	B070	crack in CMU wall	building movement	2
623	B071	crack in CMU wall, corner	building movement	4

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
618	B072	crack in CMU wall	building movement	4
614	B073	crack in CMU wall	building movement	3
614	B074	crack in CMU wall	building movement	4
616	B075	crack in CMU wall	building movement	4
622	B076	crack in CMU wall	building movement	4
633	B077	crack in tarazzo floor & brick wall	building movement	3
606	B078	crack in brick wall, corner	building movement	3
612	B079	crack in CMU wall	building movement	2
612	B080	crack in CMU wall, corner	building movement	4
613	B081	crack in CMU wall	building movement	2
601	B082	crack in brick wall	building movement	3
602	B083	crack in CMU wall, corner	building movement	2
602	B084	crack in CMU wall, corner	building movement	2
402	B085	crack in CMU wall, horiz.	building movement	2
401	B086	floor irregularity	construction irregularity	4
402	B087	floor irregularity	construction irregularity	4
571	B088	crack in brick wall, repaired	building movement	3
571	B089	crack in brick wall, corner	building movement	3
571	B090	gap under wall, grouted	building movement	4
571	B091	crack in brick wall	building movement	3
576	B092	crack in CMU wall, repaired	building movement	4
576	B093	crack in CMU wall, repaired	building movement	4
575	B094	crack in CMU wall at column	building movement	2
575	B095	crack in CMU wall, repaired	building movement	4
575	B096	crack in CMU wall	building movement	3
574	B097	crack in CMU wall	building movement	3
574	B098	crack in column, D2	unknown	1
574	B099	crack in concrete beam	unknown	1
573	B100	crack in CMU wall	building movement	3
571	B101	wet wall	broken roof drain piping -repaired	4
582	B102	wet wall	broken roof drain piping-repaired	4
582	B103	crack in CMU wall	building movement	2
583	B104	crack in CMU wall, corner & at column	building movement	2
585	B105	crack in CMU wall, horiz.	building movement	3
585	B106	crack in CMU wall, abv. Lintel	building movement	3
585	B107	crack in CMU wall	building movement	2
584	B108	crack in CMU wall	building movement	3
567	B109	crack in CMU wall	building movement	2
568	B110	crack in CMU wall	building movement	2
568	B111	crack in CMU wall at column	building movement	2
568	B112	crack in CMU wall at door	building movement	3
565	B113	crack in CMU wall	building movement	2
564	B114	crack in CMU wall	building movement	3
563	B115	crack in column, B2	unknown	1
563	B116	crack in concrete beam	unknown	1

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
563	B117	crack in CMU wall	building movement	4
560	B118	crack in CMU wall, repaired	building movement	4
557	B119	crack in CMU wall at column	building movement	4
559	B120	crack in CMU wall, repaired	building movement	4
559	B121	crack in CMU wall at column	building movement	4
558	B122	crack in CMU wall	building movement	3
558	B123	crack in CMU wall at column	building movement	2
558	B124	crack in CMU wall	building movement	3
557	B125	crack in CMU wall, repaired	building movement	4
555	B126	crack in CMU wall	building movement	3
555	B127	crack in CMU wall	building movement	3
555	B128	crack in CMU wall	building movement	3
555	B129	crack in CMU wall	building movement	4
555	B130	crack in CMU wall, corner	building movement	4
556	B131	crack in CMU wall, corner	building movement	4
556	B132	crack in CMU wall, corner	building movement	4
556	B133	crack in CMU wall, horiz.	building movement	3
577	B134	crack in tile floor	building movement	3
578	B135	crack in CMU wall, corner	building movement	3
550	B136	crack in brick wall	building movement	3
553	B137	crack in CMU wall	building movement	2
553	B138	crack in CMU wall	building movement	4
549	B139	crack in brick wall, corner	building movement	3
548	B140	crack in CMU wall	building movement	4
548	B141	crack in CMU wall	building movement	4
546	B142	crack in CMU wall	building movement	2
546	B143	crack in CMU wall	building movement	3
546	B144	crack in CMU wall	building movement	3
540	B145	crack in CMU wall at column	building movement	2
540	B146	crack in CMU wall	building movement	3
540	B147	crack in CMU wall, corner	building movement	4
537	B148	crack in CMU wall	building movement	3
537	B149	crack in CMU wall	building movement	3
539	B150	crack in CMU wall	building movement	4
528	B151	crack in CMU wall, corner & door	building movement	3
533	B152	crack in CMU wall	building movement	4
534	B153	crack in CMU wall	building movement	2
535	B154	crack in CMU wall	building movement	3
532	B155	crack in CMU wall at column	building movement	2
532	B156	crack in CMU wall, corner & door	building movement	4
522	B157	crack in CMU wall, ea side door	building movement	2
522	B158	crack in CMU wall, corner	building movement	3
591	B159	crack in CMU wall	building movement	3
591	B160	crack in CMU wall	building movement	3
590	B161	crack in CMU wall	building movement	4

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
590	B162	crack in CMU wall	building movement	4
516	B163	crack in CMU wall	building movement	2
516	B164	crack in CMU wall	building movement	2
516	B165	crack in CMU wall, horiz.	building movement	2
516	B166	crack in CMU wall, horiz.	building movement	2
505	B167	floor irregularity	building movement	3
513	B168	crack in CMU wall, corner	building movement	2
513	B169	crack in CMU wall, corner	building movement	2
513	B170	crack in CMU wall, corner	building movement	2
514	B171	crack in CMU wall	building movement	2
502	B172	crack in CMU wall	building movement	4
509	B173	crack in CMU wall	building movement	3
509	B174	crack in CMU wall	building movement	3
509	B175	crack in CMU wall, corner	building movement	2
509	B176	crack in CMU wall	building movement	2
509	B177	crack in CMU wall	building movement	2
511	B178	gap under wall	building movement	2
511	B179	gap under wall	building movement	2
511	B180	gap under wall	building movement	2
510	B181	crack in CMU/brick wall, staining	building movement	2
520	B182	crack in CMU wall	building movement	3
520	B183	crack in CMU wall	building movement	3
520	B184	crack in CMU wall, corner	building movement	2
520	B185	crack in CMU wall	building movement	3
520	B186	crack in CMU wall	building movement	2
520	B187	crack in CMU wall, corner	building movement	2
511	B188	wood debris in concrete beam	construction defect	1
515	B189	gap under wall	building movement	2
515	B190	gap under wall, grouted	building movement	4
515	B191	crack in brick wall	building movement	3
503	B192	crack in brick wall, horiz.	building movement	3
426	B193	crack in brick wall, vert.	building movement	3
594	B194	crack in CMU wall	building movement	4
595	B195	crack in brick wall	building movement	3
403	B196	crack in brick wall, corner	building movement	3
408	B197	crack in CMU wall, corner	building movement	2
408	B198	crack in CMU wall	building movement	2
406	B199	crack in CMU wall, horiz.	building movement	2
406	B200	crack in CMU wall	building movement	2
405	B201	crack in CMU wall	building movement	4
405	B202	crack in CMU wall	building movement	3
410	B203	crack in CMU wall	building movement	2
410	B204	crack in CMU wall	building movement	2
410	B205	crack in CMU wall	building movement	3
411	B206	crack in CMU wall	building movement	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
411	B207	crack in CMU wall, peeling paint	building movement	3
412	B208	crack in CMU wall, repaired	building movement	4
413	B209	crack in CMU wall	building movement	2
413	B210	crack in CMU wall	building movement	3
416	B211	crack in CMU wall	building movement	3
418	B212	crack in CMU wall, horiz.	building movement	2
419	B213	crack in CMU wall, horiz.	building movement	2
420	B214	crack in CMU wall, horiz.	building movement	2
421	B215	crack in CMU wall, horiz.	building movement	2
421	B216	crack in CMU wall, horiz.	building movement	2
422	B217	crack in CMU wall	building movement	3
422	B218	crack in CMU wall, horiz.	building movement	3
422	B219	crack in CMU wall & roof leak	building movement	2
423	B220	crack in CMU wall	building movement	4
424	B221	crack in CMU wall	building movement	4
425	B222	crack in CMU wall	building movement	2
425	B223	crack in CMU wall,corner	building movement	4
427	B224	crack in CMU wall	building movement	2
427	B225	crack in CMU wall, horiz.	building movement	2
427	B226	crack in CMU wall, horiz.	building movement	3
427	B227	crack in CMU wall	building movement	2
427	B228	crack in CMU wall	building movement	2
427	B229	crack in CMU wall	building movement	2
500	B230	crack in CMU wall	building movement	2
426	B231	crack in brick wall	building movement	3
426	B232	crack in column, F12	unknown	1
430	B233	crack in CMU wall	building movement	2
498	B234	crack in CMU wall	building movement	3
498	B235	crack in CMU wall	building movement	2
497	B236	crack in CMU wall, horiz.	building movement	2
430	B237	crack in concrete roof slab	unknown	4
430	B238	crack in concrete roof slab	unknown	4
431	B239	crack in CMU wall, repaired	building movement	4
432	B240	crack in CMU wall, horiz.	building movement	2
440	B241	crack in CMU wall, horiz.	building movement	2
485	B242	crack in CMU wall, horiz.	building movement	3
485	B243	crack in CMU wall, horiz.	building movement	2
486	B244	crack in tile floor & CMU wall	building movement	3
486	B245	crack in CMU wall, horiz.	building movement	4
483	B246	crack in CMU wall	building movement	4
445	B247	crack in CMU wall	building movement	2
446	B248	crack in CMU wall	building movement	3
446	B249	crack in CMU wall	building movement	2
447	B250	crack in CMU wall	building movement	2
447	B251	crack in concrete roof slab	unknown	3

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
448	B252	crack in CMU wall, horiz.	building movement	2
448	B253	crack in CMU wall	building movement	2
447	B254	crack in concrete roof slab	unknown	3
447	B255	crack in concrete roof slab	unknown	3
447	B256	crack in CMU wall	building movement	4
451	B257	crack in CMU wall, horiz.	building movement	3
451	B258	crack in CMU wall	building movement	2
452	B259	crack in CMU wall	building movement	2
452	B260	crack in CMU wall	building movement	2
452	B261	crack in concrete floor slab	building movement	3
453	B262	crack in CMU wall, corner	building movement	2
457	B263	crack in CMU wall at column	building movement	2
444	B264	crack in CMU wall, repaired	building movement	4
460	B265	crack in CMU wall, repaired	building movement	4
460	B266	gap under wall	building movement	2
460	B267	crack in CMU wall, repaired	building movement	4
460	B268	crack in CMU wall	building movement	3
460	B269	wall base 3/4" above floor	building movement	4
467	B270	crack in CMU wall	building movement	3
461	B271	crack in CMU wall	building movement	2
461	B272	crack in concrete floor slab	building movement	3
461	B273	crack in CMU wall	building movement	2
461	B274	crack in CMU wall	building movement	3
461	B275	crack in CMU wall	building movement	2
461	B276	crack in CMU wall	building movement	2
461	B277	crack in CMU wall	building movement	2
461	B278	crack in CMU wall	building movement	3
461	B279	crack in CMU wall	building movement	2
461	B280	crack in CMU wall	building movement	2
461	B281	crack in CMU wall	building movement	3
461	B282	crack in CMU wall	building movement	3
475	B283	crack in CMU wall	building movement	2
471	B284	crack in CMU wall	building movement	2
471	B285	crack in CMU wall	building movement	3
476	B286	gap under wall	building movement	2
477	B287	gap under wall	building movement	2
476	B288	gap under wall	building movement	2
480	B289	gap under wall	building movement	2
471	B290	crack in CMU wall	building movement	2
471	B291	crack in CMU wall	building movement	3
494	B292	crack in CMU wall	building movement	2
494	B293	crack in CMU wall & roof leak	building movement	2
494	B294	crack in CMU wall & roof leak	building movement	2
494	B295	crack in CMU wall & roof leak	building movement	2
494	B296	crack in CMU wall	building movement	2

**ASSESSMENT REPORT**  
**Attachment 'A'**  
**Blacksburg High School**

Space #	Photo/ Issue #	Issue Description	Possible Cause	Action
494	B297	crack in CMU wall	building movement	2
494	B298	crack in CMU wall	building movement	2
494	B299	crack in CMU wall	building movement	2
494	B300	crack in CMU wall	building movement	2
494	B301	crack in CMU wall	building movement	1
597	B302	crack in brick wall	building movement	4
599	B303	crack in brick wall, horiz.	building movement	3
447	B304	crack in concrete column I20	unknown	2
447	B305	crack in beam above column I19	unknown	3
448	B306	exposed rebar above column I17	unknown	2
452	B307	crack in beam above column H20	unknown	3
440	B308	crack in beam above column I13	unknown	3
431	B309	crack in beams above column I15	unknown	3
495	B310	cold joint in concrete column F13	construction defect	3
Extr.	B311	cold joint concrete column H13	construction defect	3
420	B313	crack in beam above column I11	unknown	3
421	B314	crack in beams above column I12	unknown	3
418	B315	exposed rebar above column I9	unknown	2
414	B316	crack in beam above column I8	unknown	3
587	B317	gap under wall	building movement	2
530	B319	crack in concrete column B12	unknown	3
530	B320	crack in beams above column A12	unknown	3
541	B321	crack in beam above column A9	unknown	3
548	B322	crack in beam above column A7	unknown	2
547	B323	CMU spalling at column B6	unknown	4
547	B324	crack in beam above column B6	unknown	3
550	B325	floor irregularity	building movement	3
563	B327	crack in beams above column A2	unknown	3
604	B330	gap under base cabinet	building movement	3
633	B331	slab settlement	building movement	3
Extr.	C001	cracked column, column I15	building movement	1
Extr.	C002	cracked column, column I16	building movement	1
Extr.	C003	cracked column, column C12	building movement	1
Extr.	C005	cracked column, column I8	building movement	1
Extr.	C010	crack in brick wall	building movement	3
Extr.	C011	crack in brick wall	building movement	2
Extr.	C019	cracked column, A5	building movement	1
Extr.	C023	cracked column, A10	building movement	1
Extr.	C027	cracked column, D12	building movement	1





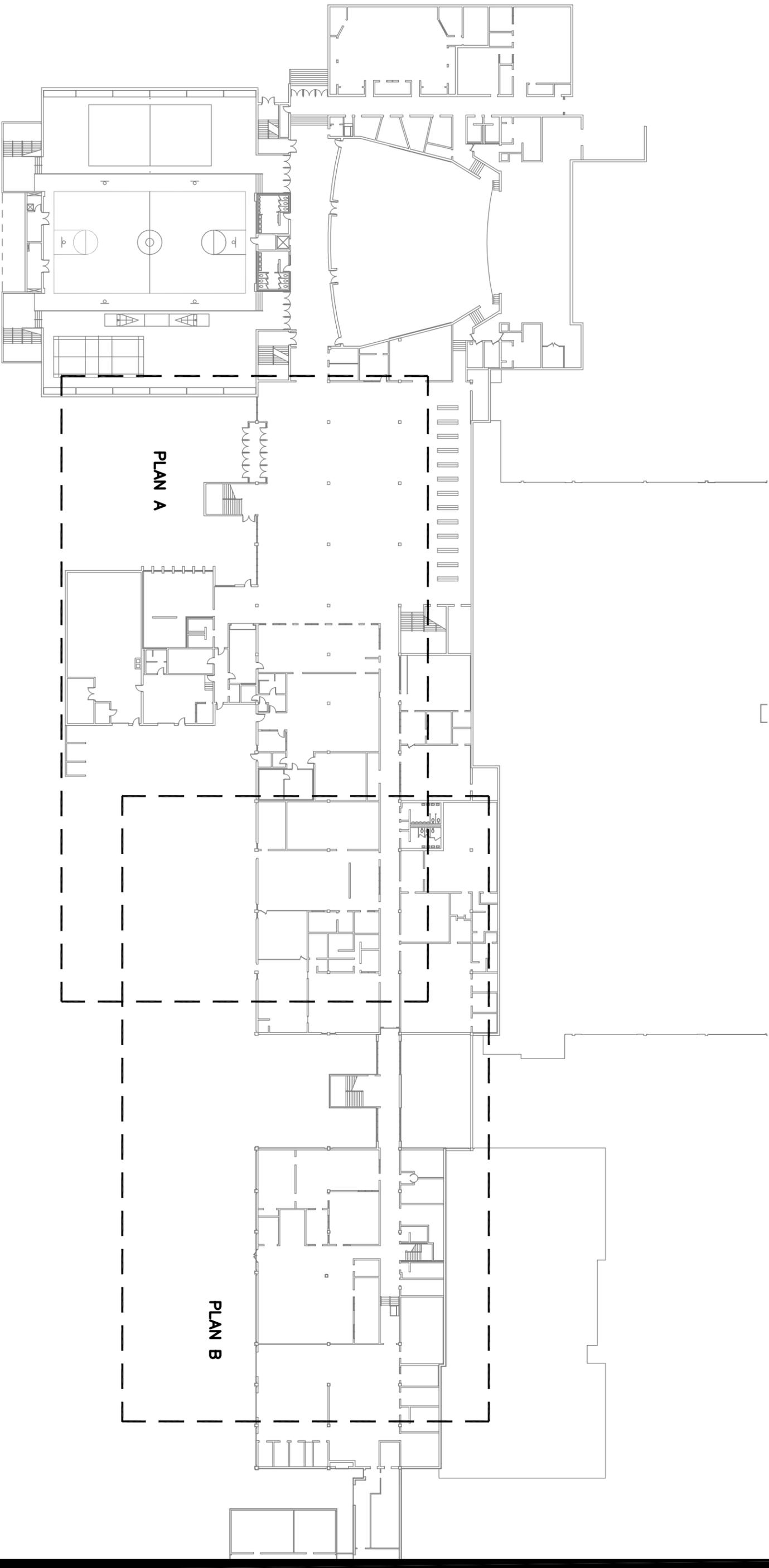
COMM No. 01019

07 JUNE 10

# FIRST FLOOR, OVERALL PLAN



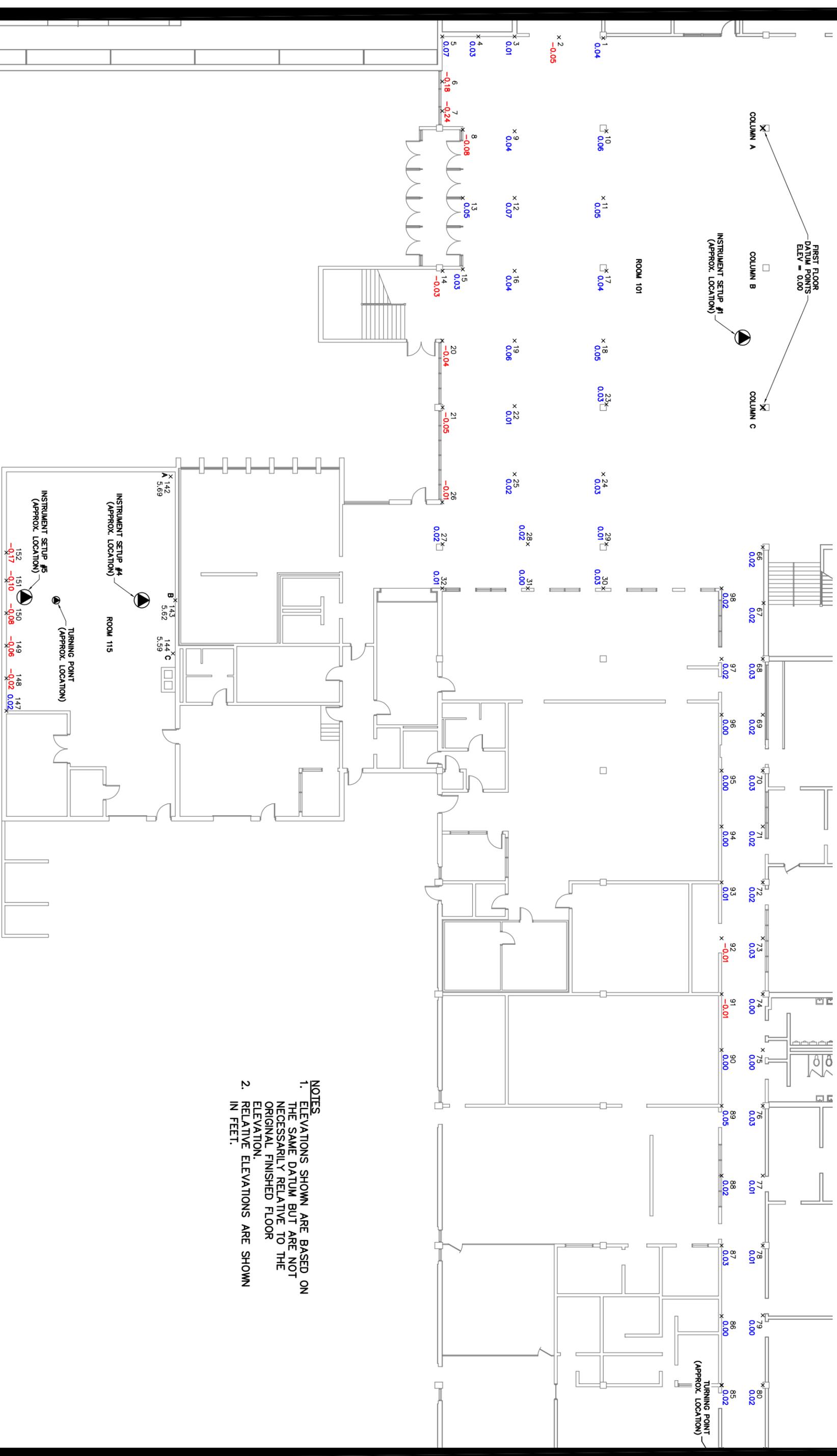
## Montgomery County Public Schools Facility Assessment - Blacksburg High School Floor Elevations Attachment 'B'



# FIRST FLOOR, PLAN A



## Montgomery County Public Schools Facility Assessment - Blacksburg High School Floor Elevations Attachment 'B'

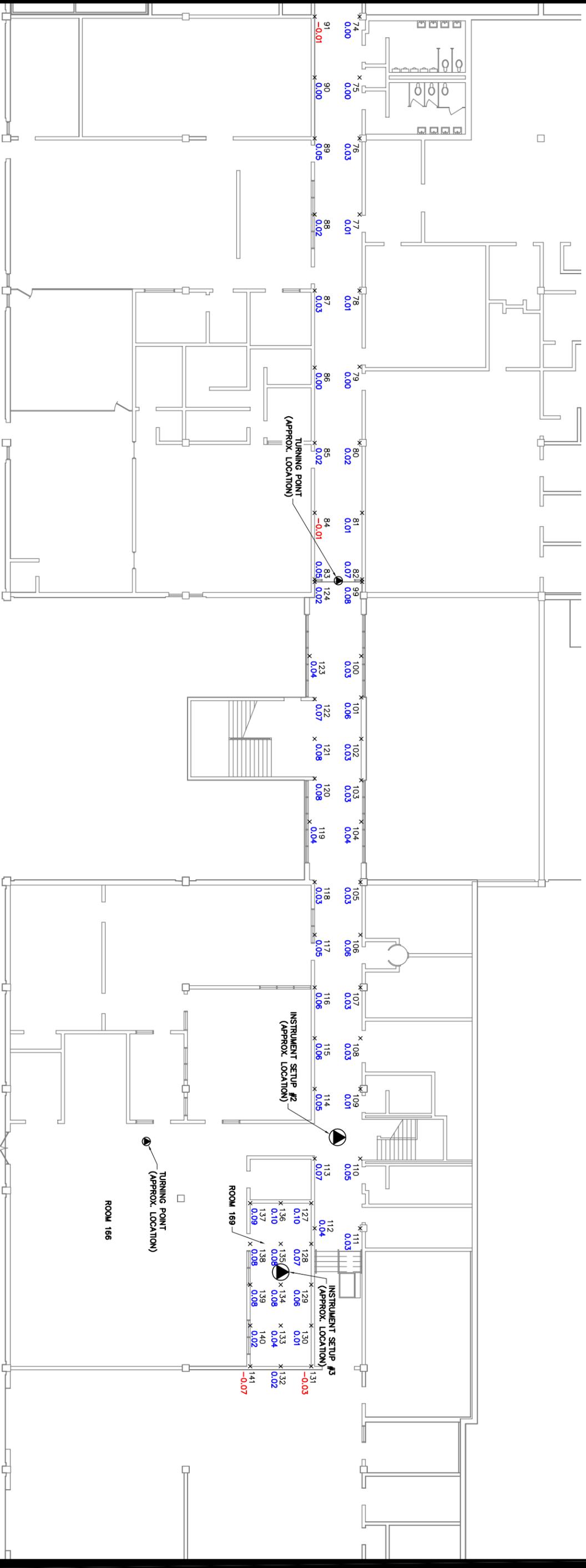


- NOTES**
1. ELEVATIONS SHOWN ARE BASED ON THE SAME DATUM BUT ARE NOT NECESSARILY RELATIVE TO THE ORIGINAL FINISHED FLOOR ELEVATION.
  2. RELATIVE ELEVATIONS ARE SHOWN IN FEET.

**FIRST FLOOR, PLAN B**



**Montgomery County Public Schools  
 Facility Assessment - Blacksburg High School  
 Floor Elevations  
 Attachment 'B'**



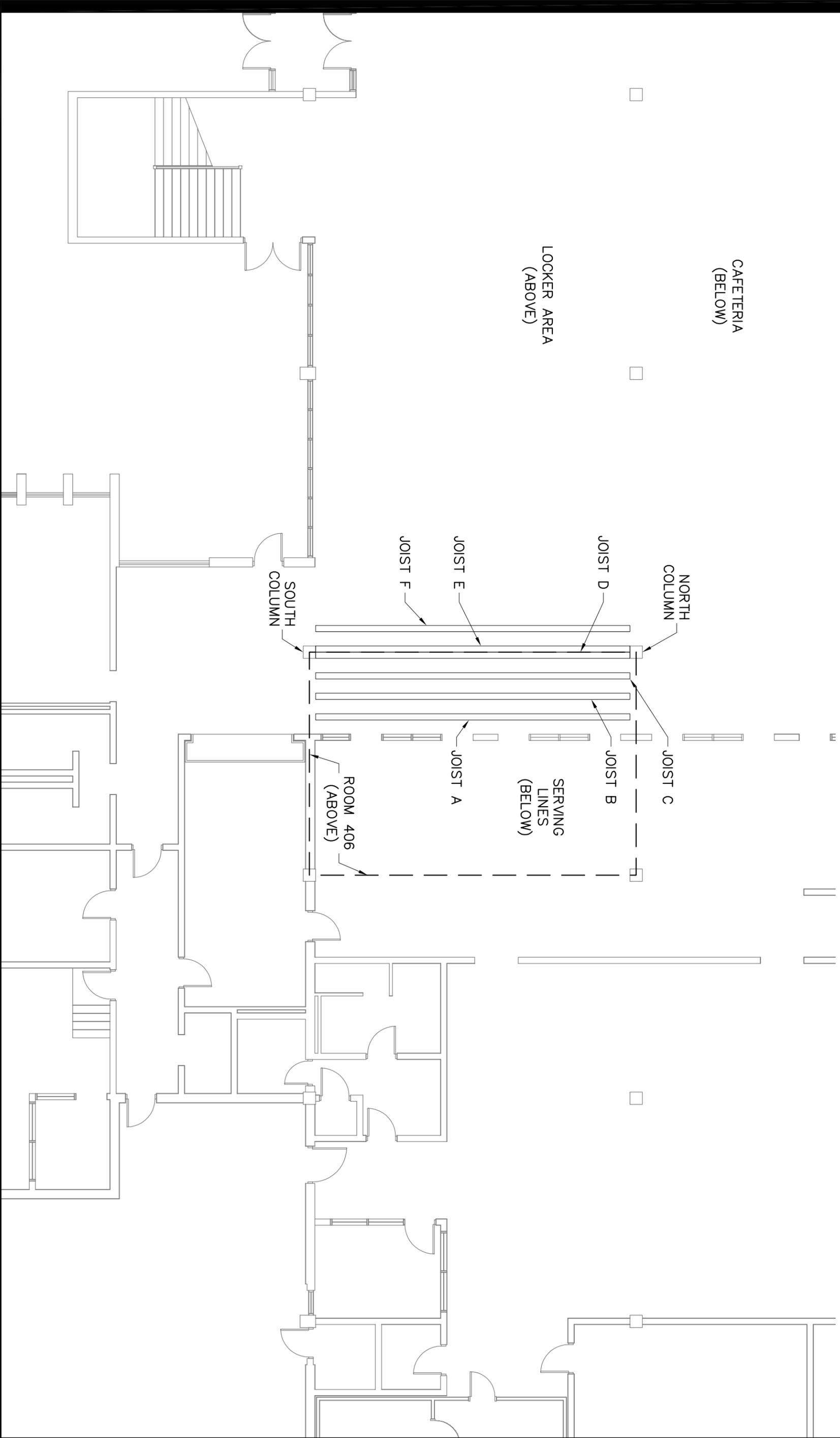
- NOTES**
1. ELEVATIONS SHOWN ARE BASED ON THE SAME DATUM BUT ARE NOT NECESSARILY RELATIVE TO THE ORIGINAL FINISHED FLOOR ELEVATION.
  2. RELATIVE ELEVATIONS ARE SHOWN IN FEET.

**SECOND FLOOR, PARTIAL FRAMING PLAN**



**Montgomery County Public Schools  
 Facility Assessment - Blacksburg High School  
 Floor Elevations**

**Attachment 'B'**

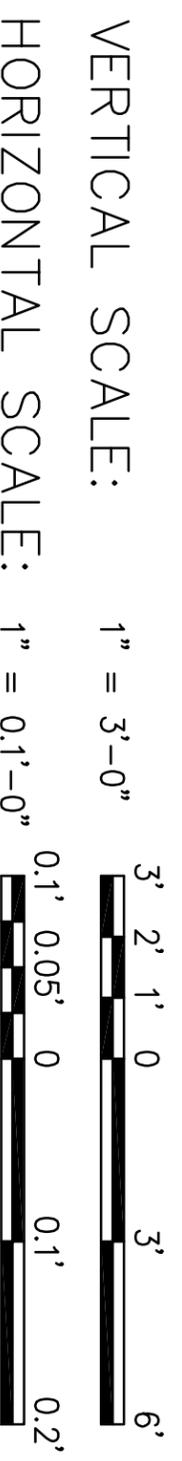
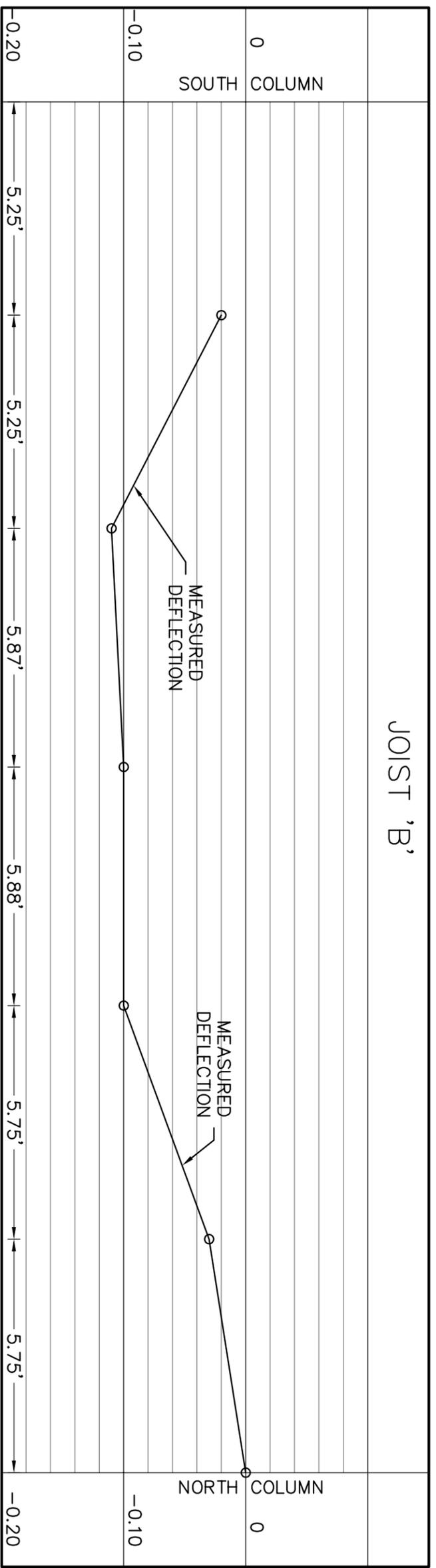
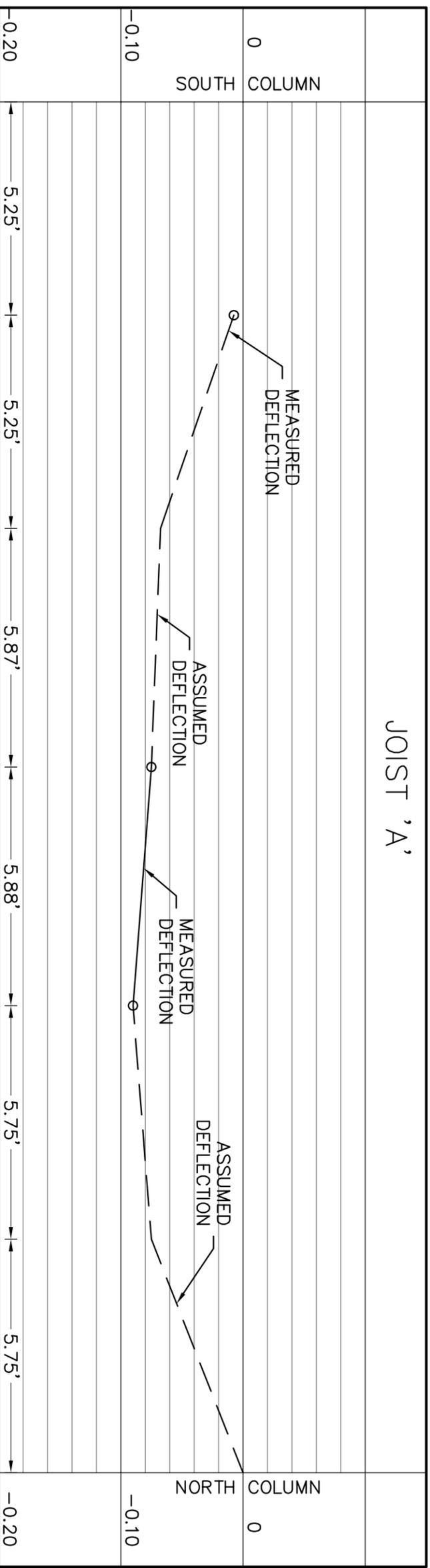


**JOIST PROFILES A & B**

NOTE: DEFLECTIONS ARE RELATIVE BASED ON THE "NORTH COLUMN" END OF THE JOIST.

**Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Floor Elevations**

**Attachment 'B'**



**JOIST PROFILES C & D**

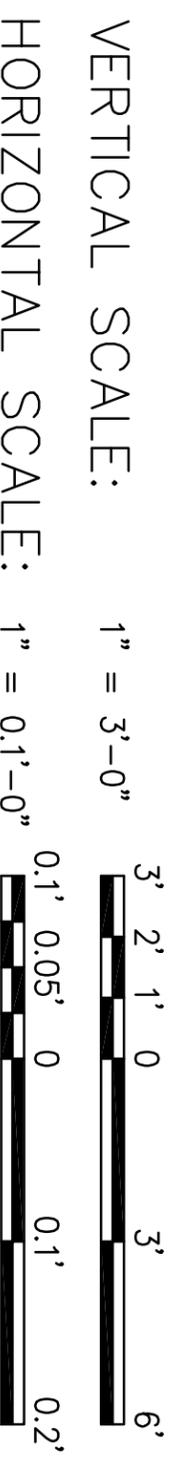
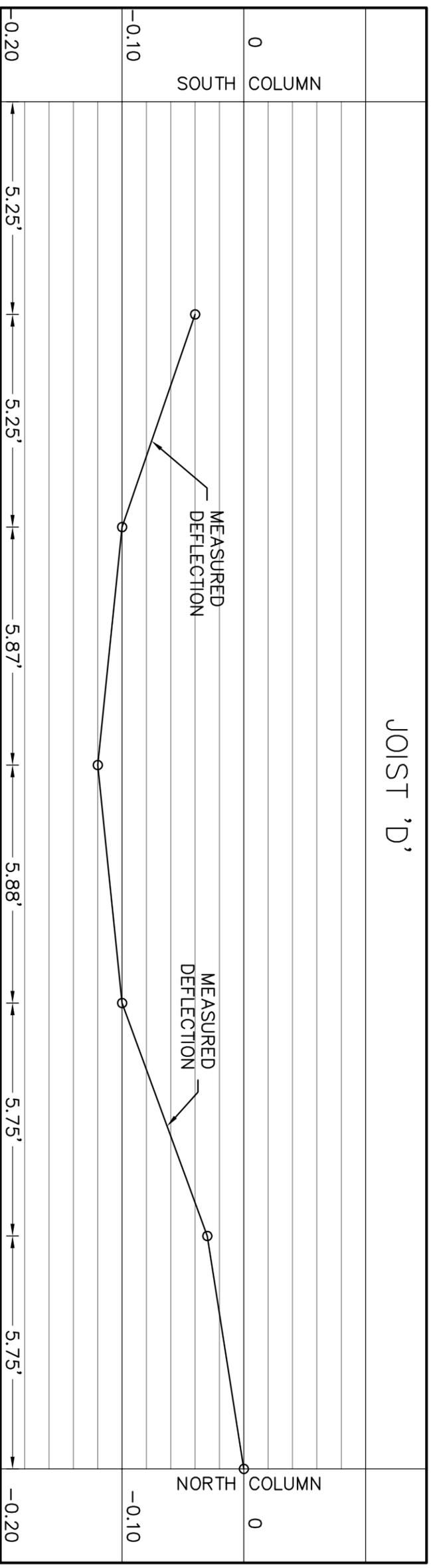
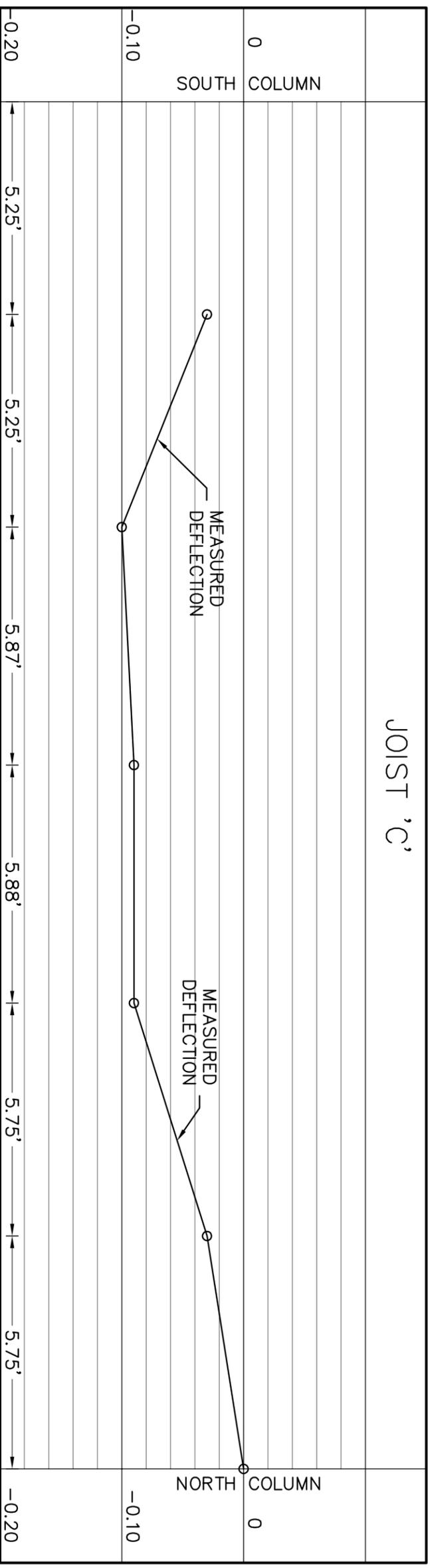
NOTE: DEFLECTIONS ARE RELATIVE BASED ON THE "NORTH COLUMN" END OF THE JOIST.

**Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Floor Elevations**

Attachment 'B'



ARCHITECTS AND ENGINEERS

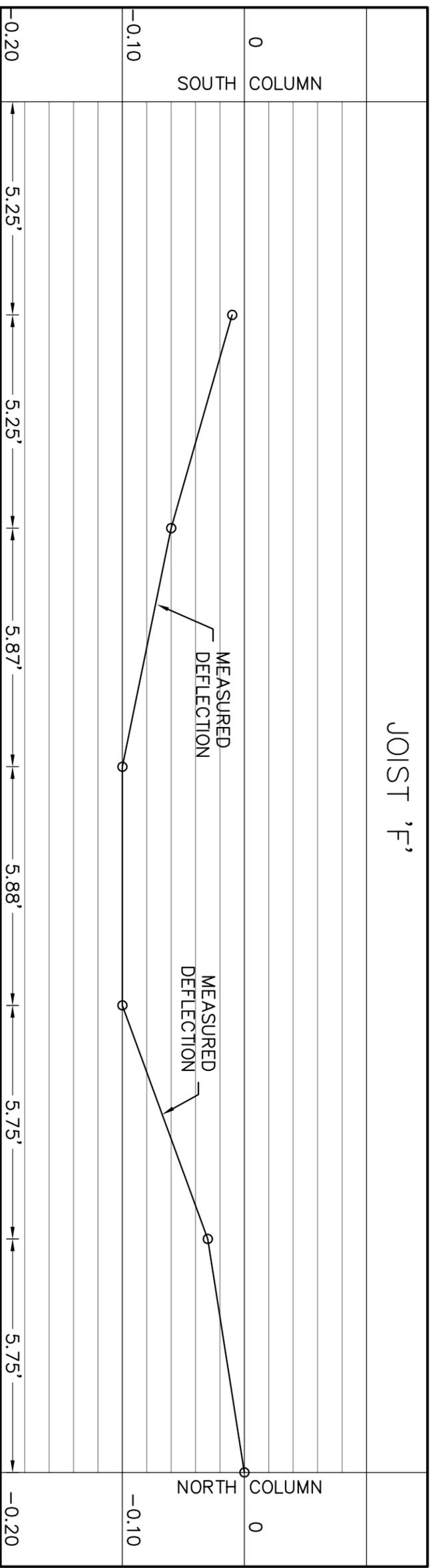
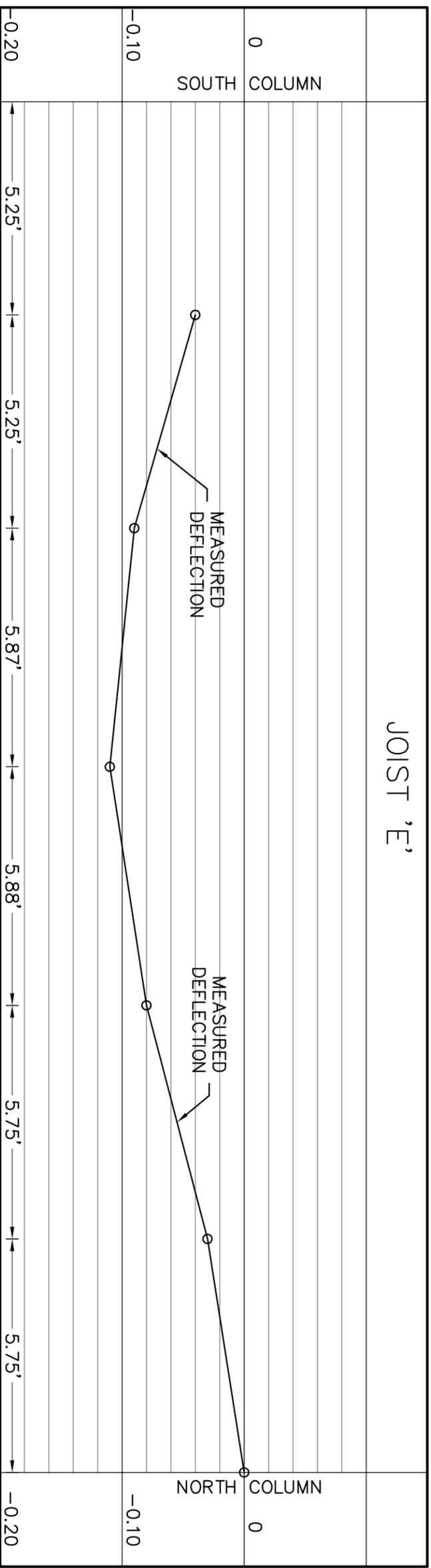


**JOIST PROFILES E & F**

NOTE: DEFLECTIONS ARE RELATIVE BASED ON THE "NORTH COLUMN" END OF THE JOIST.

**Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Floor Elevations**

Attachment 'B'

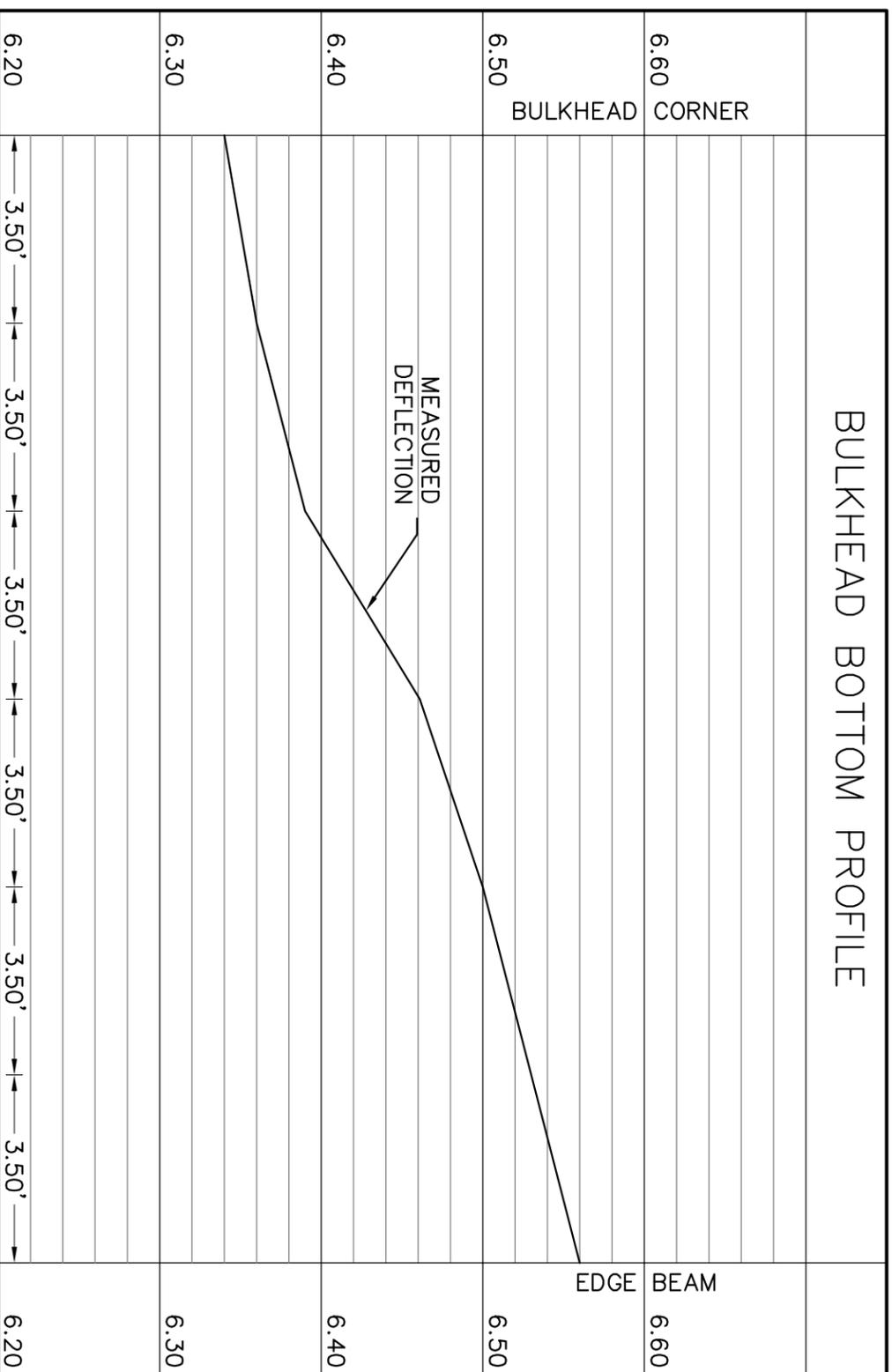


VERTICAL SCALE: 1" = 3'-0"  
 HORIZONTAL SCALE: 1" = 0.1'-0"

**BULKHEAD PROFILE**

NOTE: SPOT ELEVATIONS ALONG THE BULKHEAD ARE MEASURED ABOVE THE INSTRUMENT.

Montgomery County Public Schools  
 Facility Assessment - Blacksburg High School  
 Floor Elevations Attachment 'B'



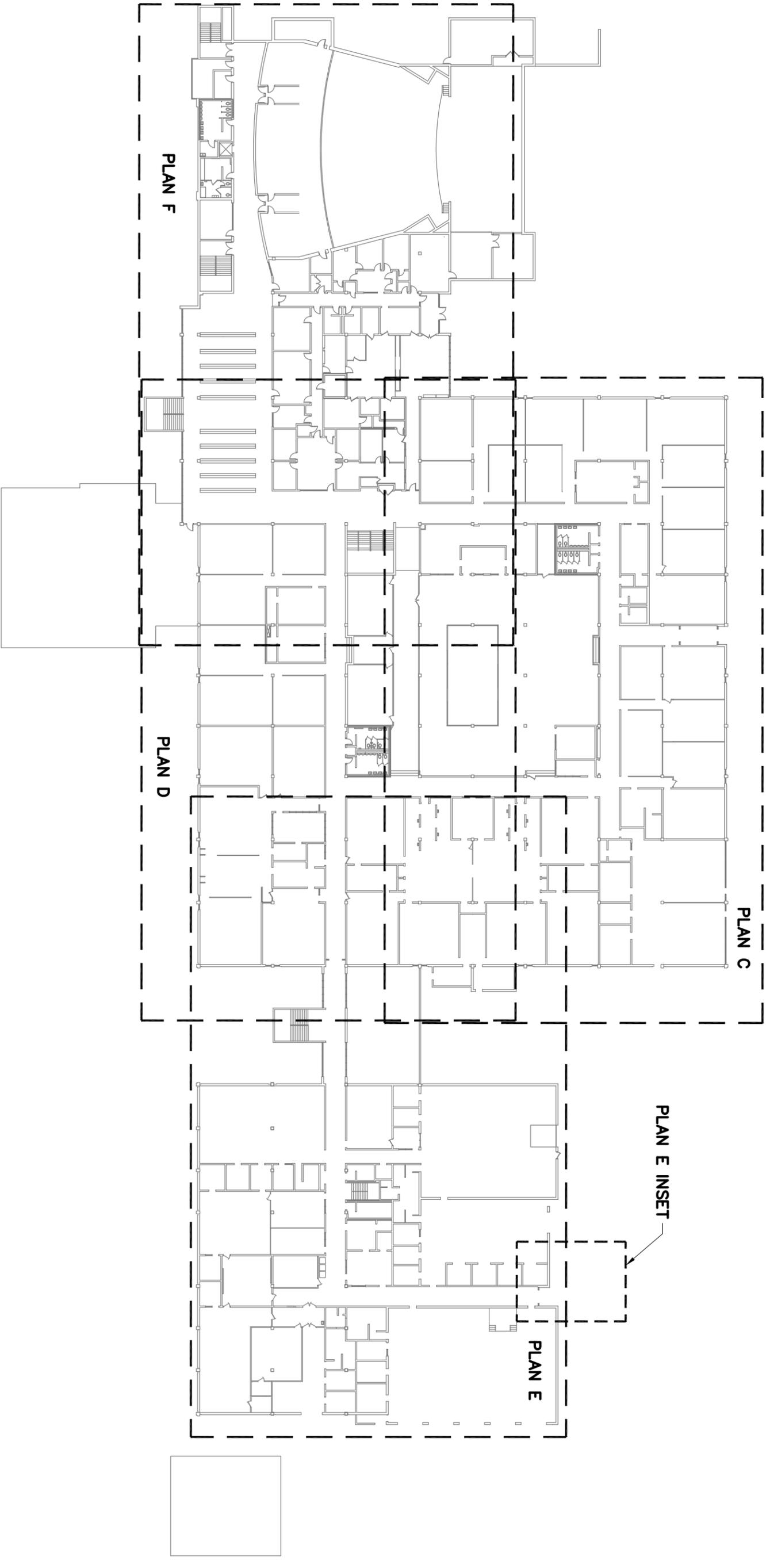
VERTICAL SCALE: 1" = 3'-0"

HORIZONTAL SCALE: 1" = 0.1'-0"

**SECOND FLOOR, OVERALL PLAN**



Montgomery County Public Schools  
 Facility Assessment - Blacksburg High School  
 Floor Elevations  
 Attachment 'B'





# SECOND FLOOR, PLAN D



## Montgomery County Public Schools Facility Assessment - Blacksburg High School Floor Elevations Attachment 'B'



- NOTES**
1. ELEVATIONS SHOWN ARE BASED ON THE SAME DATUM BUT ARE NOT NECESSARILY RELATIVE TO THE ORIGINAL FINISHED FLOOR ELEVATION.
  2. RELATIVE ELEVATIONS ARE SHOWN IN FEET.

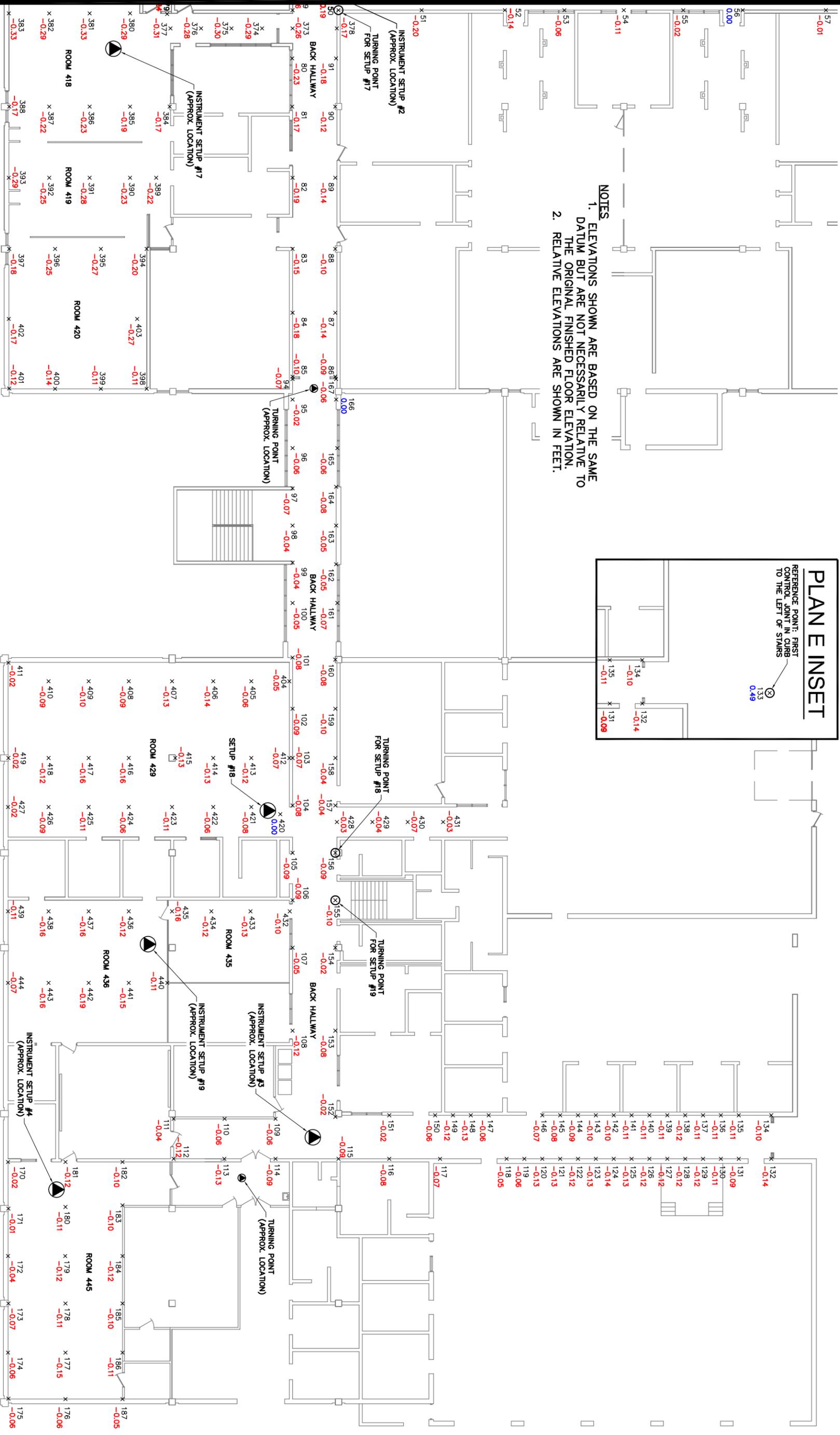
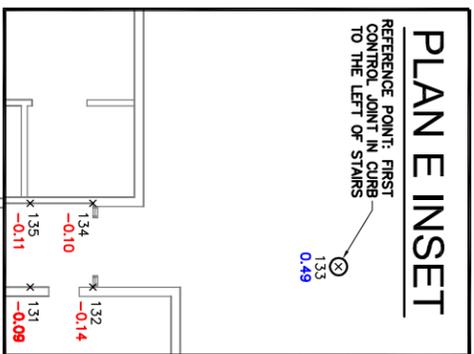
# SECOND FLOOR, PLANE



## Montgomery County Public Schools Facility Assessment - Blacksburg High School Floor Elevations Attachment 'B'



- NOTES**
1. ELEVATIONS SHOWN ARE BASED ON THE SAME DATUM BUT ARE NOT NECESSARILY RELATIVE TO THE ORIGINAL FINISHED FLOOR ELEVATION.
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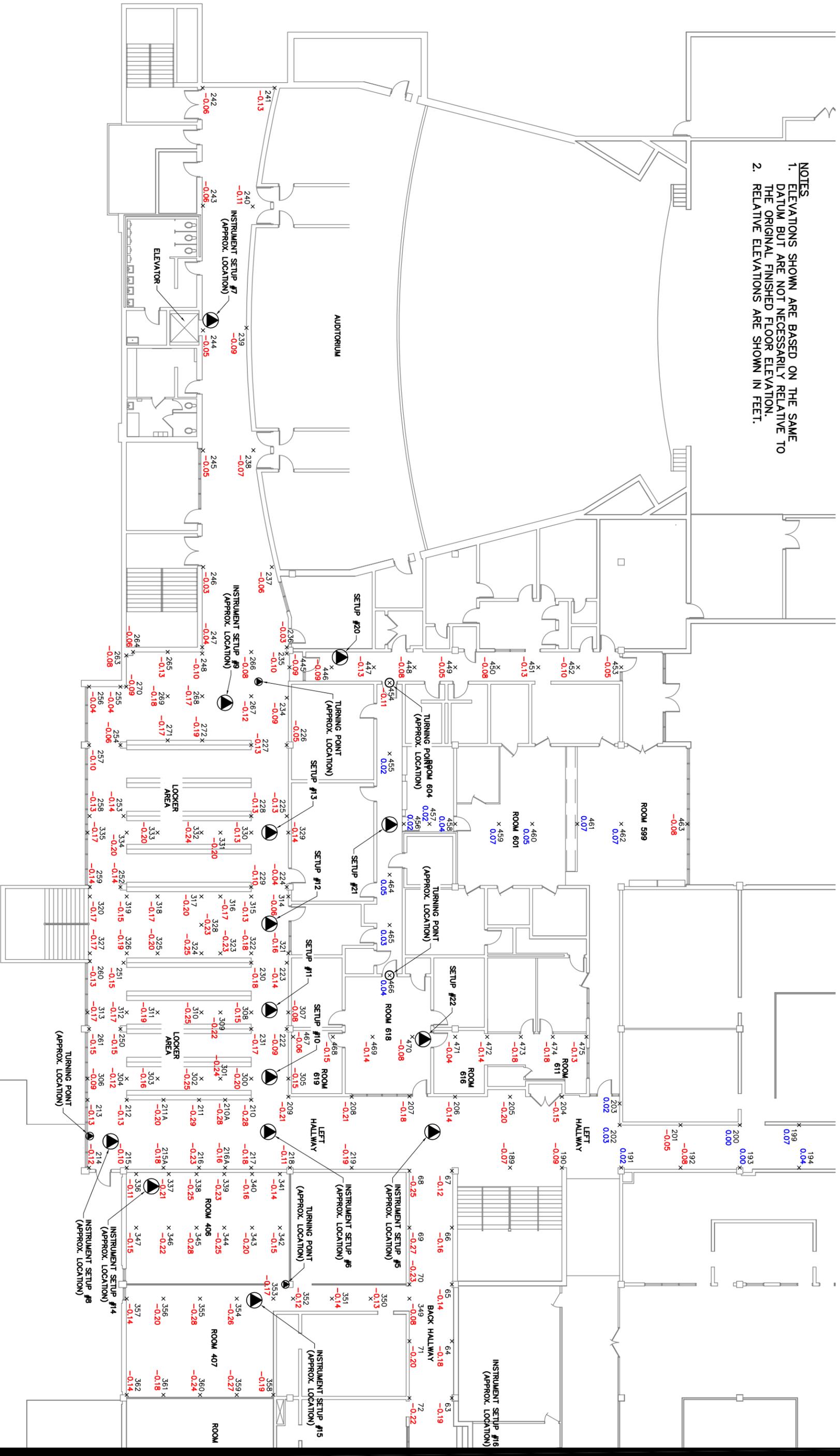
# SECOND FLOOR, PLAN F

1" = 20'-0"  
20' 10' 0 20' 40'

## Montgomery County Public Schools Facility Assessment - Blacksburg High School Attachment 'B'



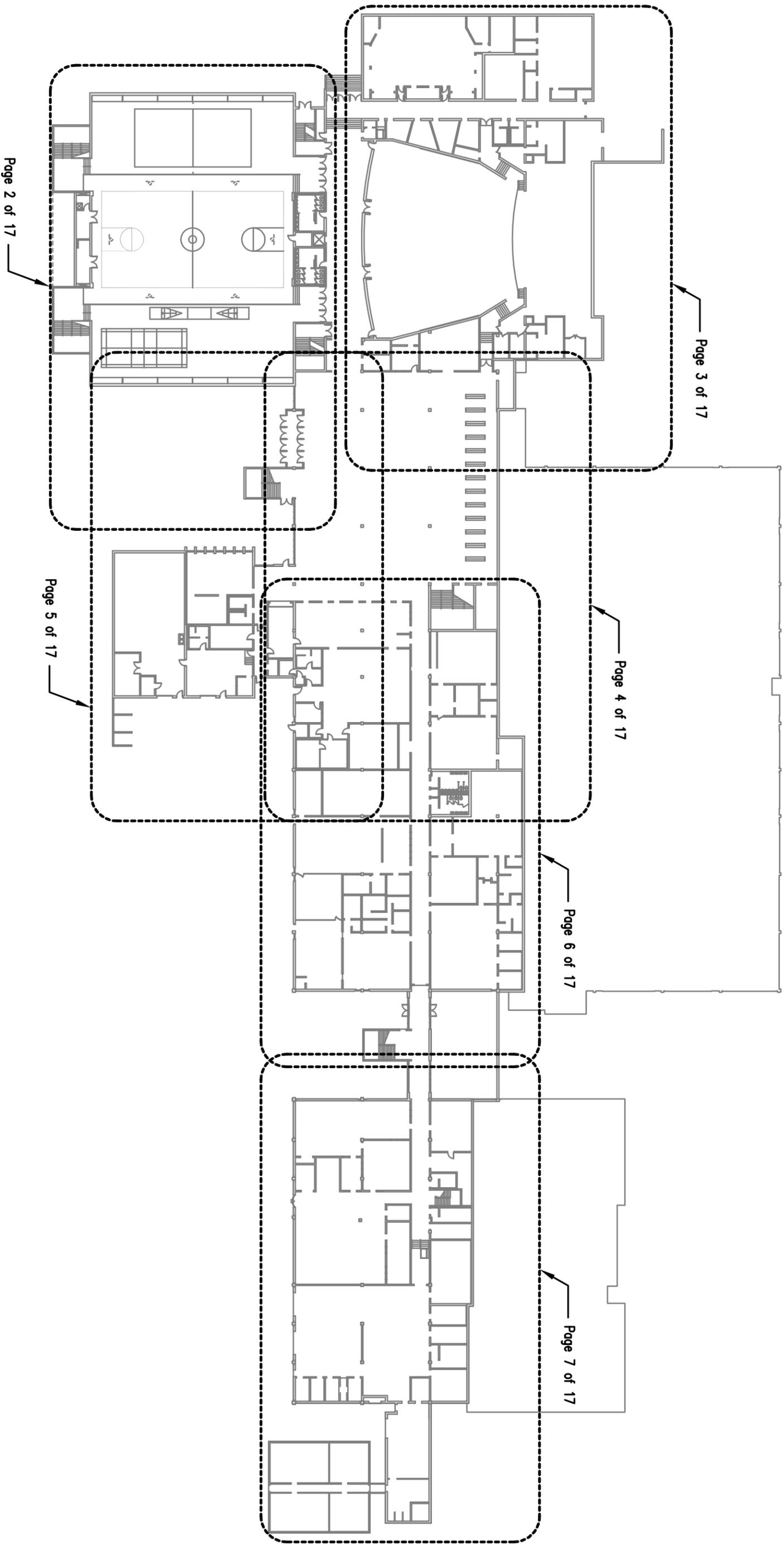
- NOTES**
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  2. RELATIVE ELEVATIONS ARE SHOWN IN FEET.



#  
INDICATES PICTURE  
NUMBER



Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'

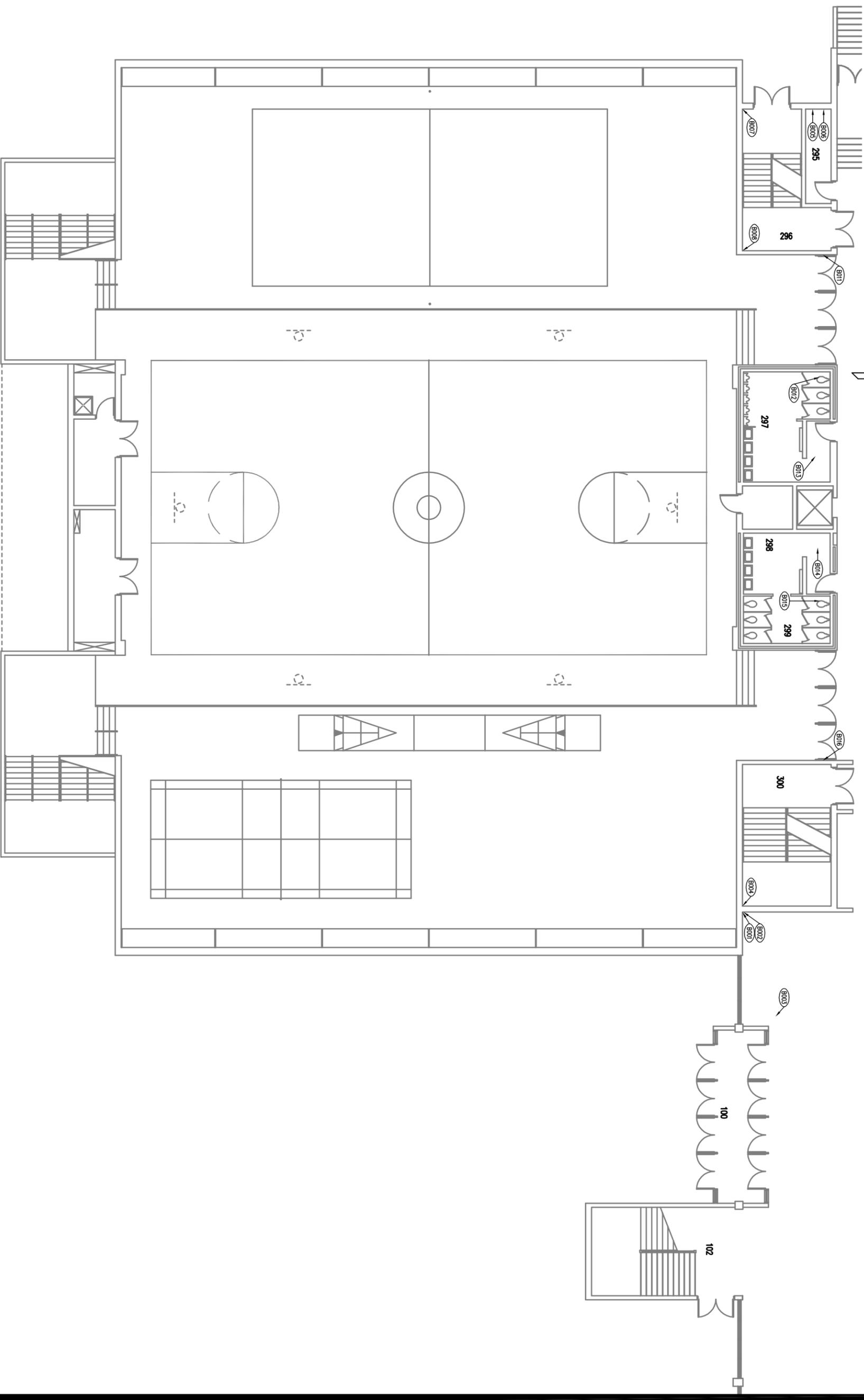


FIRST FLOOR - PARTIAL PLAN

# INDICATES PICTURE NUMBER



Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'



FIRST FLOOR - PARTIAL PLAN

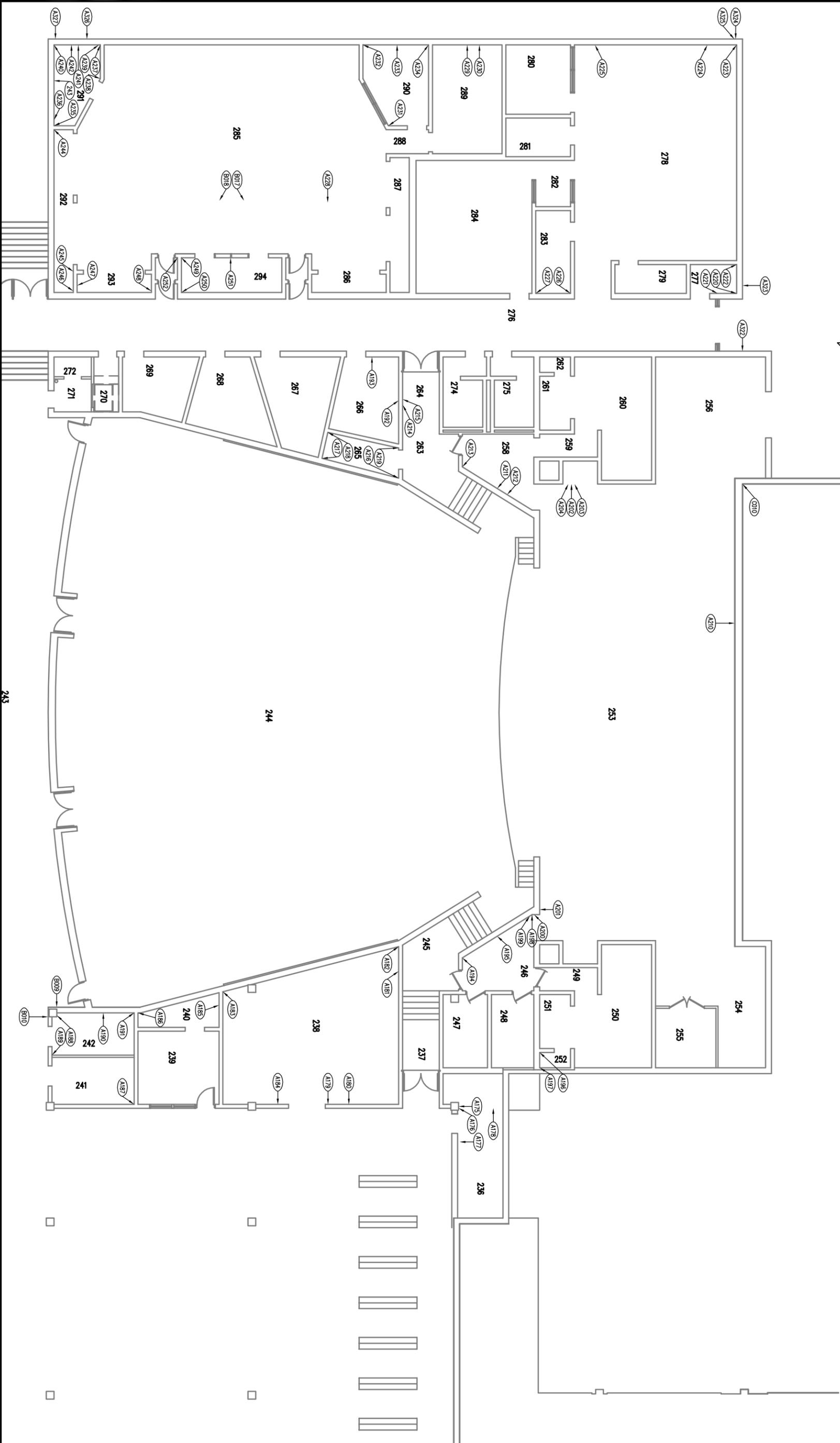
# INDICATES PICTURE NUMBER



Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'



ARCHITECTS AND ENGINEERS

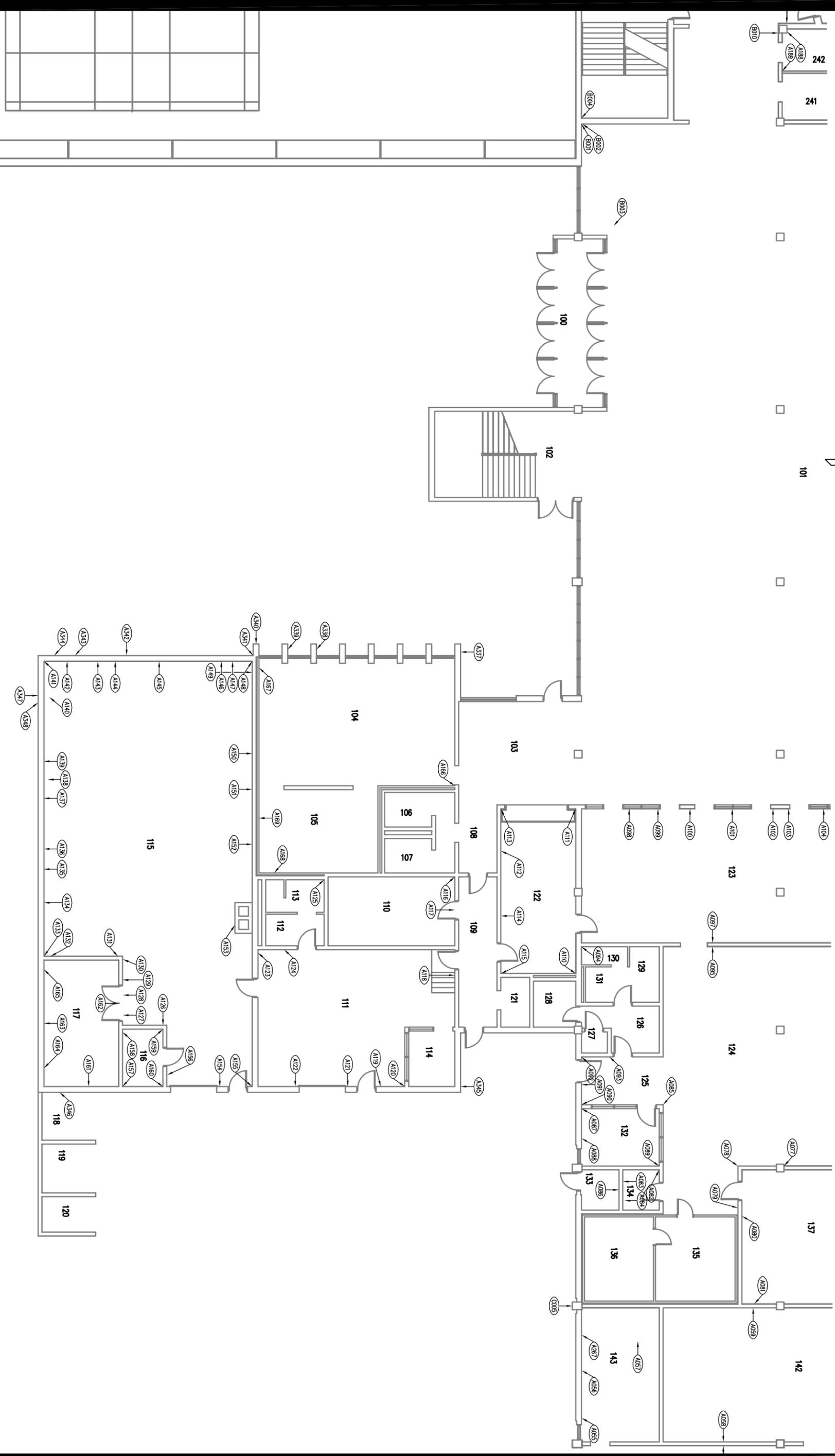




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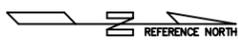


Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'



COMM NO. 01019  
07 JUNE 10  
FIRST FLOOR - PARTIAL PLAN

# INDICATES PICTURE  
NUMBER

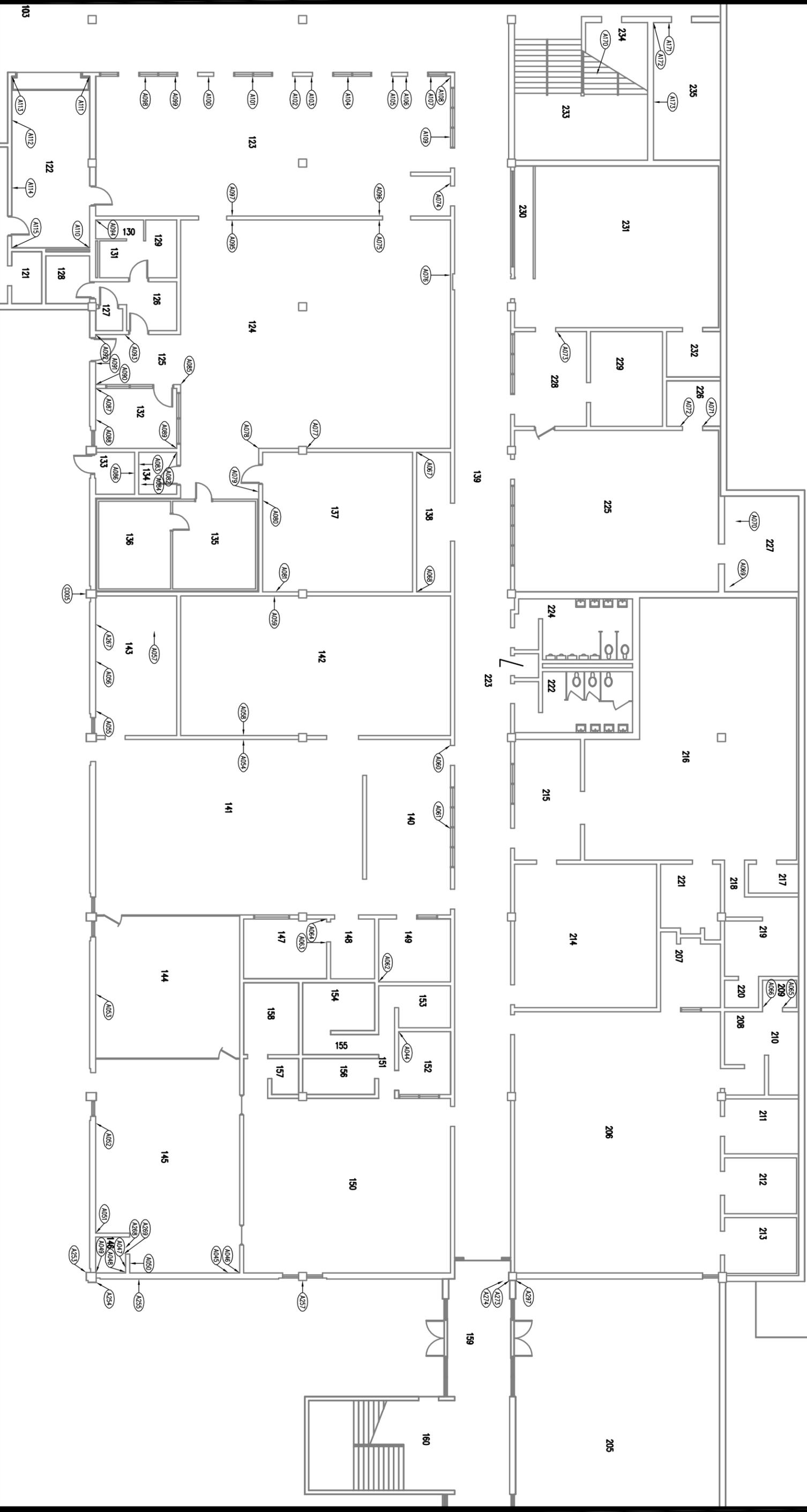


# Montgomery County Public Schools Facility Assessment - Blacksburg High School Picture Locations

Attachment 'C'



ARCHITECTS AND ENGINEERS



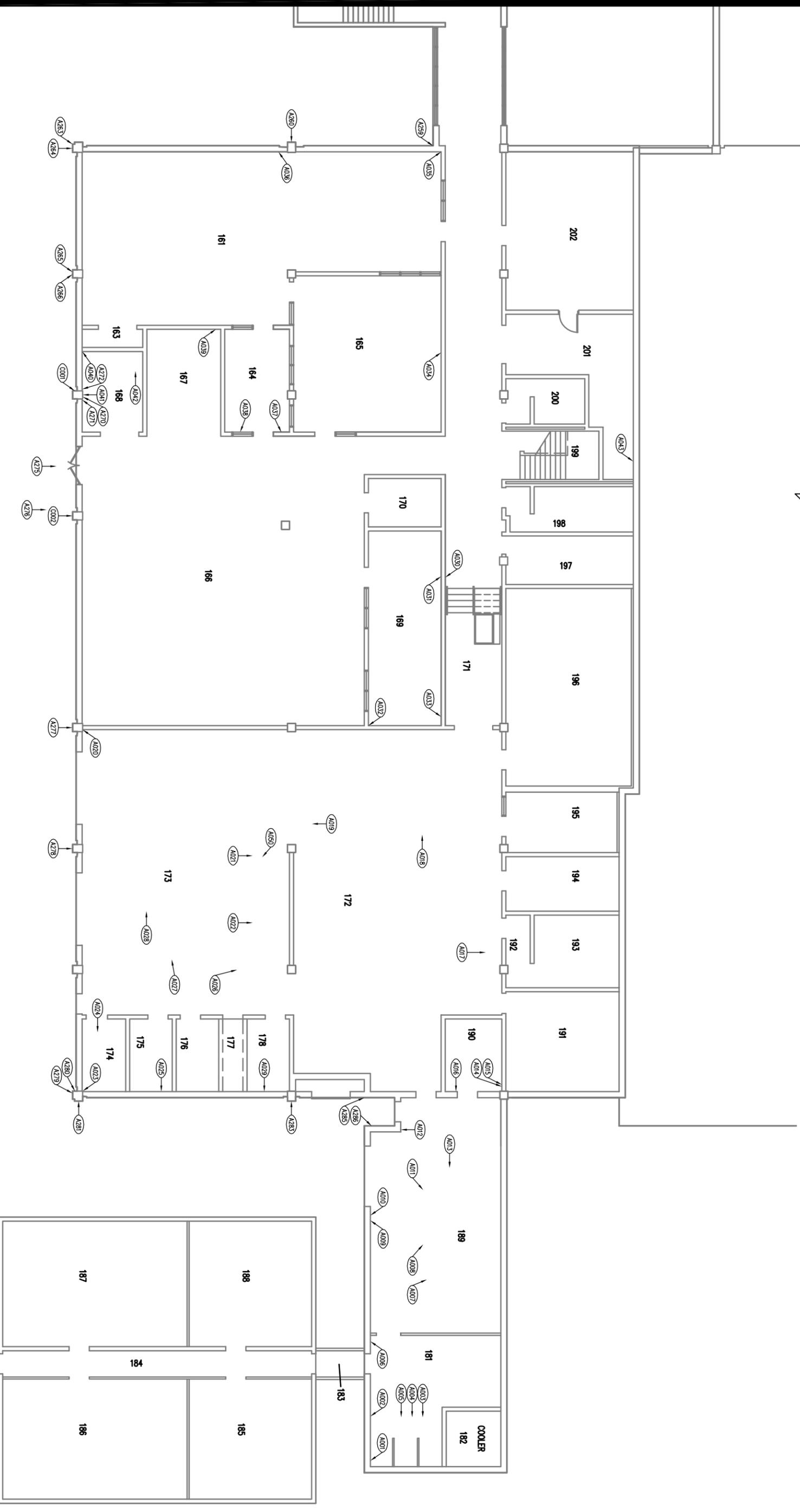
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FIRST FLOOR - PARTIAL PLAN

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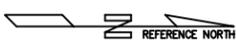


# Montgomery County Public Schools Facility Assessment - Blacksburg High School Picture Locations

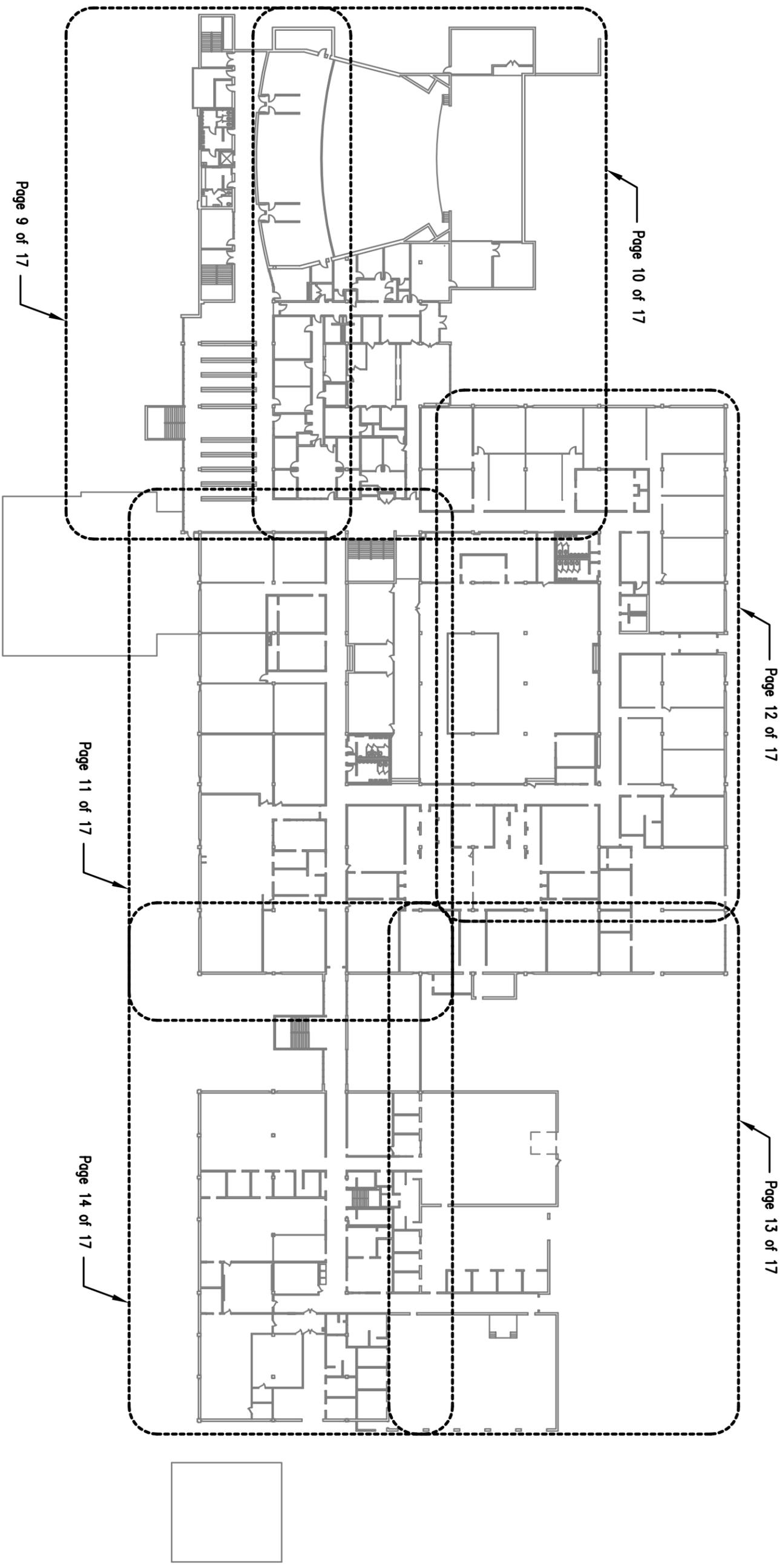
Attachment 'C'



# INDICATES PICTURE  
NUMBER



Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'



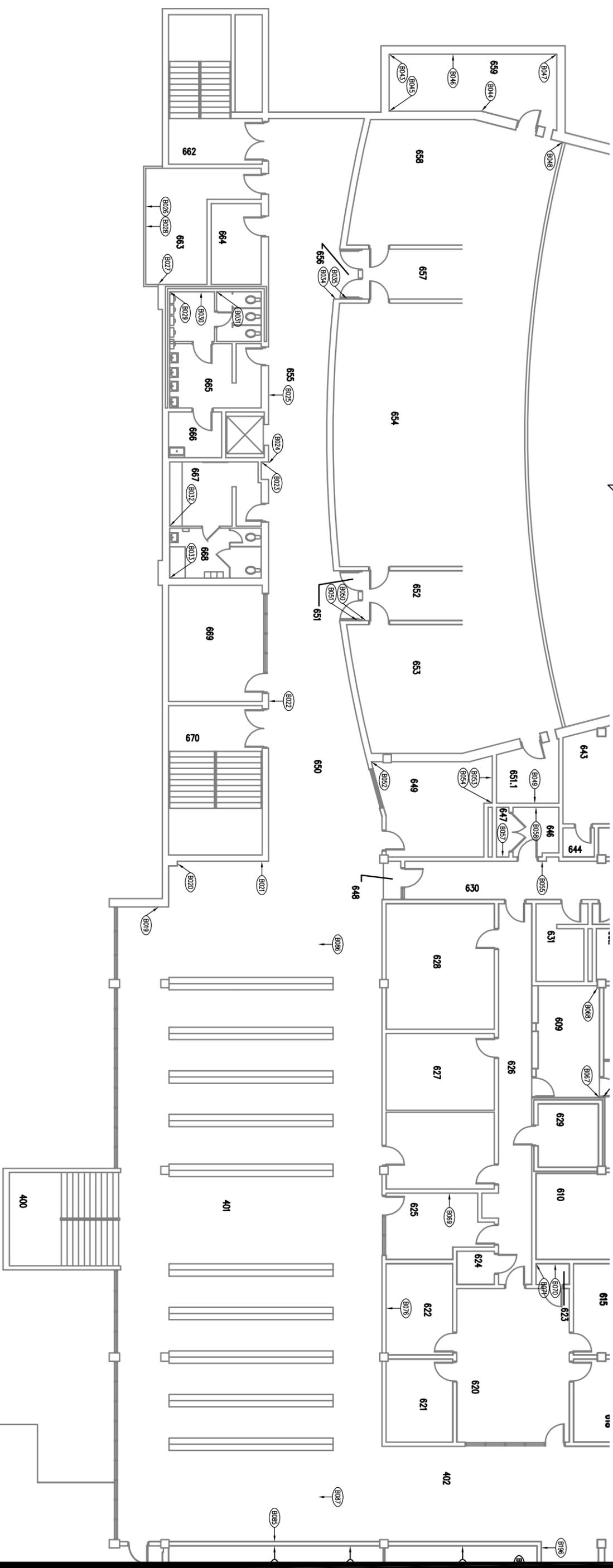
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SECOND FLOOR - PARTIAL PLAN

07 JUNE 10

#  
INDICATES PICTURE  
NUMBER



Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'



COMM NO. 01019  
07 JUNE 10  
SECOND FLOOR - PARTIAL PLAN

#  
INDICATES PICTURE  
NUMBER



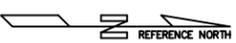
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Attachment 'C'

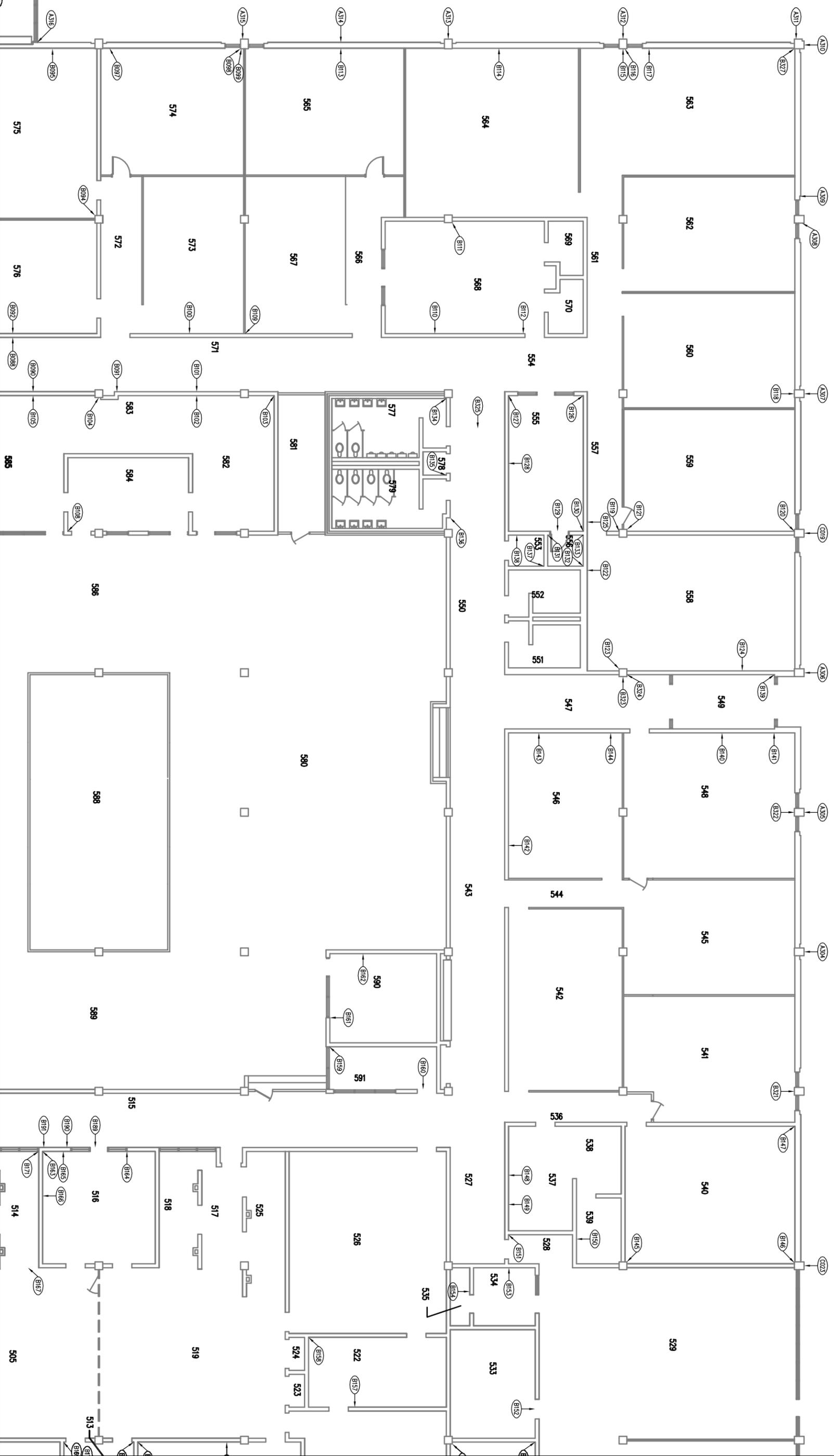




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INDICATES PICTURE  
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Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'





Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations

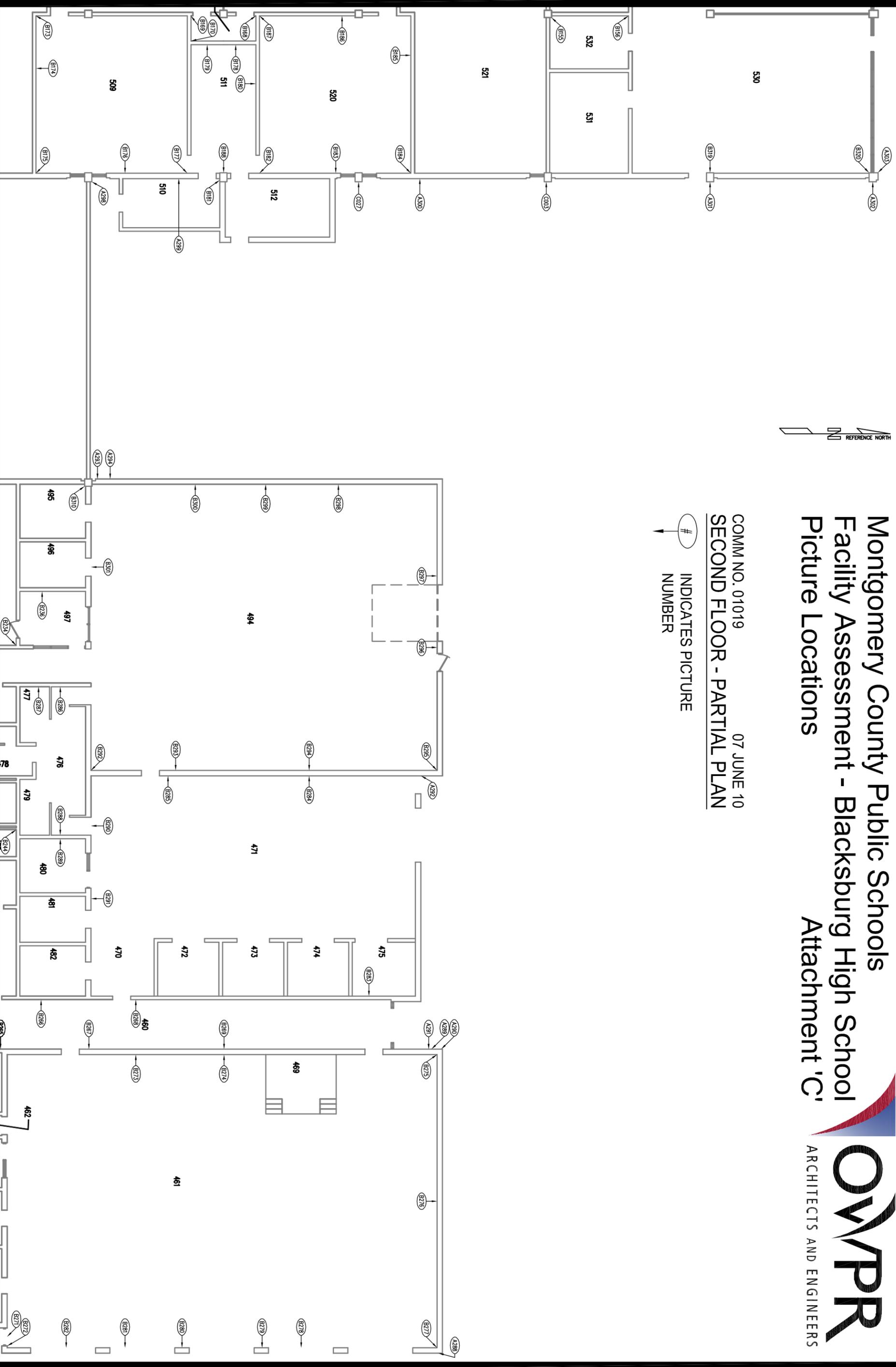
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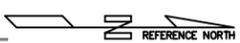
ARCHITECTS AND ENGINEERS

COMM NO. 01019 07 JUNE 10  
SECOND FLOOR - PARTIAL PLAN

# INDICATES PICTURE  
NUMBER



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INDICATES PICTURE  
NUMBER



# Montgomery County Public Schools Facility Assessment - Blacksburg High School Picture Locations

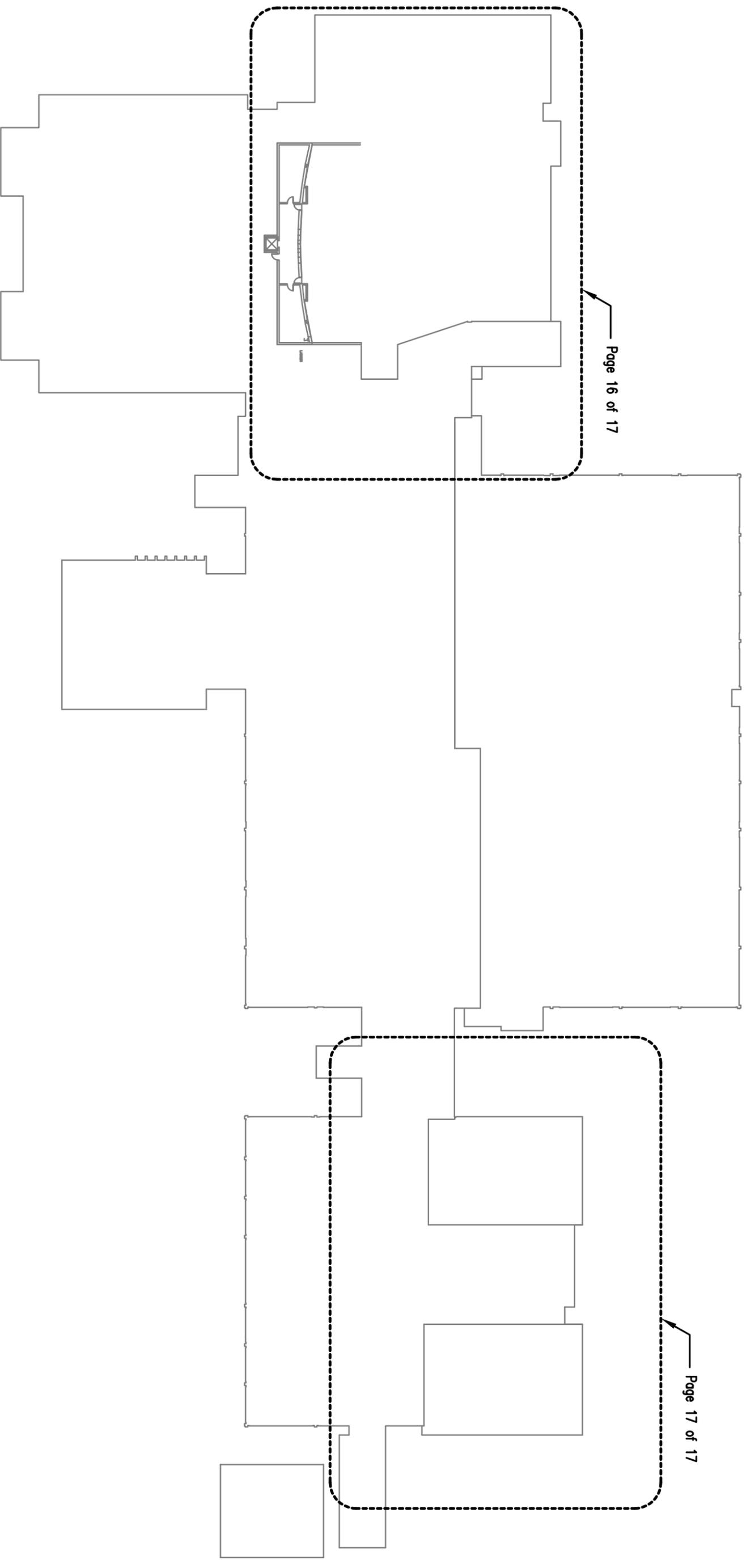
## Attachment 'C'



#  
INDICATES PICTURE  
NUMBER



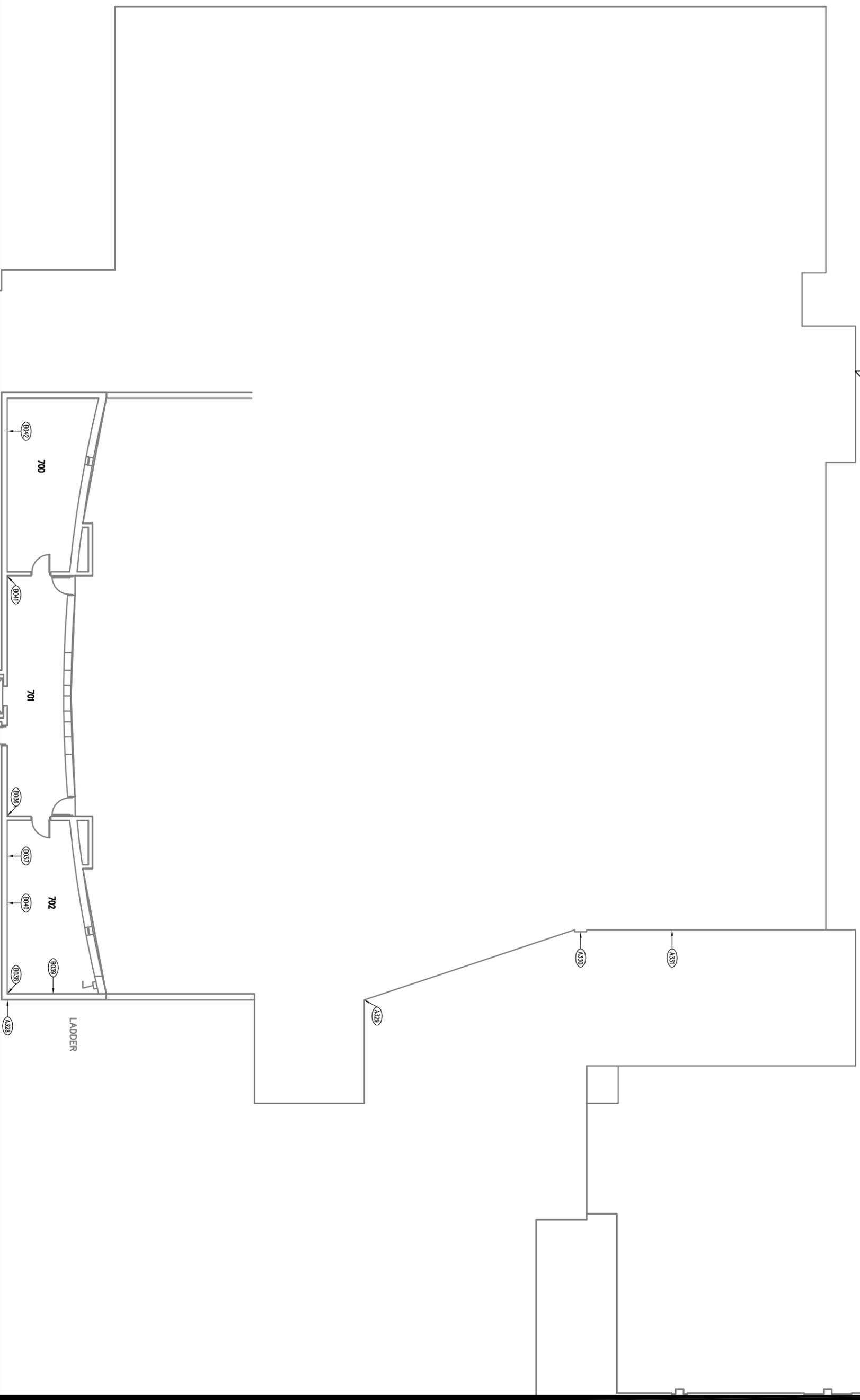
Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'



# INDICATES PICTURE  
NUMBER

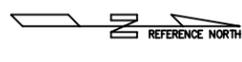


Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations  
Attachment 'C'

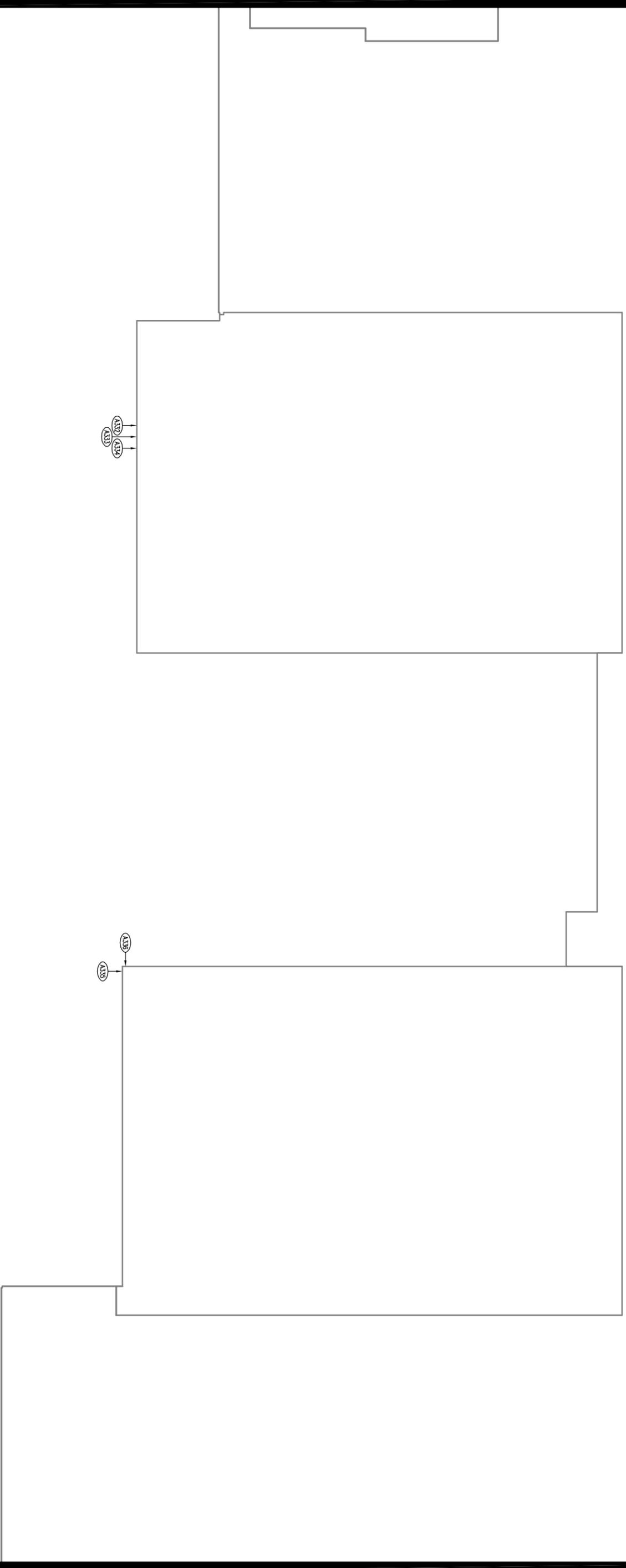


COMM NO. 01019 07 JUNE 10  
**BALCONY - PARTIAL PLAN**

#  
INDICATES PICTURE  
NUMBER



**Montgomery County Public Schools  
Facility Assessment - Blacksburg High School  
Picture Locations**  
Attachment 'C'



# Montgomery County Public Schools

## Blacksburg High School

### Facility Assessment

A/E Commission Number 1019

OWPR, Inc. June 7, 2010

#### **Executive Summary**

Following the collapse of the gymnasium at Blacksburg High School in February, 2010, Montgomery County Public Schools requested that Engineers from OWPR, Inc conduct an assessment of the remaining Blacksburg High School Building. A proposal from OWPR, Inc including a detailed scope of work was submitted to, and subsequently approved by, Montgomery County Public Schools. In general, the following components were visually inspected throughout the existing building:

- Concrete floor and roof slabs
- Concrete masonry unit (CMU) walls
- Concrete columns, walls, and beams
- Steel Columns
- Steel beams, joists, and girders
- Steel and cementitious roof deck

The following components were visually inspected in areas that, in our professional opinion, could possibly have received damage as a result of the gym collapse. These areas are generally defined as all first and second floor spaces West of the Cafeteria/Commons area.

- Mechanical and domestic water piping
- Mechanical ductwork
- Mechanical duct and piping supports
- Mechanical units
- Plumbing fixtures
- Power distribution system
- Data network
- Fire alarm system
- Public address system

- Security system
- Closed Circuit TV system
- Media delivery system

Visible issues with building components and systems listed above were identified and assessed. Each issue was assigned an action level and the possible cause of the issue was determined. Action levels for the issues are as follows:

- 1 = Remediation required prior to occupancy .
- 2 = Remediate and monitor. Remediation not required prior to occupancy.
- 3 = No remediation required. Monitor for additional movement or damage.
- 4 = No action required.

The data was assembled into a report (**Attachment 'A'**), which follows this summary. Digital pictures were taken of each issue and are referenced in the report. A DVD containing these pictures is included as part of this report. Plans indicating picture locations are included as **Attachment 'C'**.

**Notes:**

1. ***Issues identified in spaces immediately adjacent to the former gym and coded as action level 1 may be remediated after occupancy of the school if approved by local Authorities Having Jurisdiction and the Design Professional.***
2. ***Where "Building Movement" is listed as the possible cause of an issue documented in Attachment 'A', this includes foundation settlement, deflection of structural members, and/or expansion and contraction of building materials.***

**Structural Assessment Note**

During the assessment, noticeable deflection of floor slabs was identified in several areas of the building. OWPR, Inc. surveyed the areas of concern with a laser level. The results of this survey are shown in **Attachment 'B'**. It should be noted that the elevations indicated are relative to reference datum benchmarks on each floor. These benchmarks were assigned an elevation of 0.00', and are indicated on **Attachment 'B'**. The elevations shown on **Attachment 'B'** are used to illustrate how the building may have moved, or was constructed, relative to other points on the floor. The 0.00' benchmark elevations should not be construed as the original "as-built" floor elevation, since no USGS benchmark was tied during our survey to establish an elevation relative to sea level, and furthermore, no as-built survey exists to document the floor elevations as constructed.

Because of the noticeable deflections of the floor slab, documented in **Attachment 'B'**, OWPR, Inc. is analyzing several existing structural components to verify their design capacities, and to determine if the deflections exhibited compromise the structural system of the building. In situ testing of several concrete structural members is being done to verify as-built conditions and assumptions used during the analysis. This analysis will be complete by July 1, 2010. The results of this analysis may require additional remediation efforts, therefore, determination of a possible date of re-occupancy of the building cannot be made until after July 1, 2010.

## Montgomery County Public Schools

### Blacksburg High School

#### Facility Assessment

A/E Commission Number 1032

OWPR, Inc. July 1, 2010

#### Addendum No. 1

In the June 7, 2010 Blacksburg High School Facility Assessment report, noticeable deflections in the floor slab are mentioned as a catalyst for further analysis and in-place testing. In place testing and analysis has been ongoing over the past four weeks and has focused on the concrete structural frames in a portion of the building. Thus far, the testing has identified six concrete beams that are not code compliant (do not meet 1969 Building Code) and will require modifications prior to occupancy. The concrete frames are depicted on the attached three dimensional drawing. The frames consist of concrete beams and columns of varying sizes, each reinforced with steel bars. The six beams that have thus far been identified as requiring modifications are shown in red.

OWPR had previously requested in-place testing of only a few locations, as verification that as-built conditions matched the design. However, the testing revealed that, in many cases, the design documents available to us do not accurately depict the as-built condition of the concrete beams. Because of this inconsistency, OWPR has recommended that all concrete beams and several concrete columns in the building be tested to verify their as-built condition. Multiple concrete samples have been taken by the testing agency to verify its compressive strength, and reinforcing steel samples have been taken to verify the steel's tensile strength.

The in-place testing incorporates the use of several testing methods, including the use of Ground Penetrating Radar (GPR), an R Meter, and destructive investigation to identify, quantify, and locate reinforcing steel within the concrete beams. The reinforcing steel occurs at two critical locations in the concrete beams, near the top of the beam over columns, and near the bottom of the beam between columns. Both top and bottom steel must be identified, quantified, and located before OWPR's analysis can be finalized.

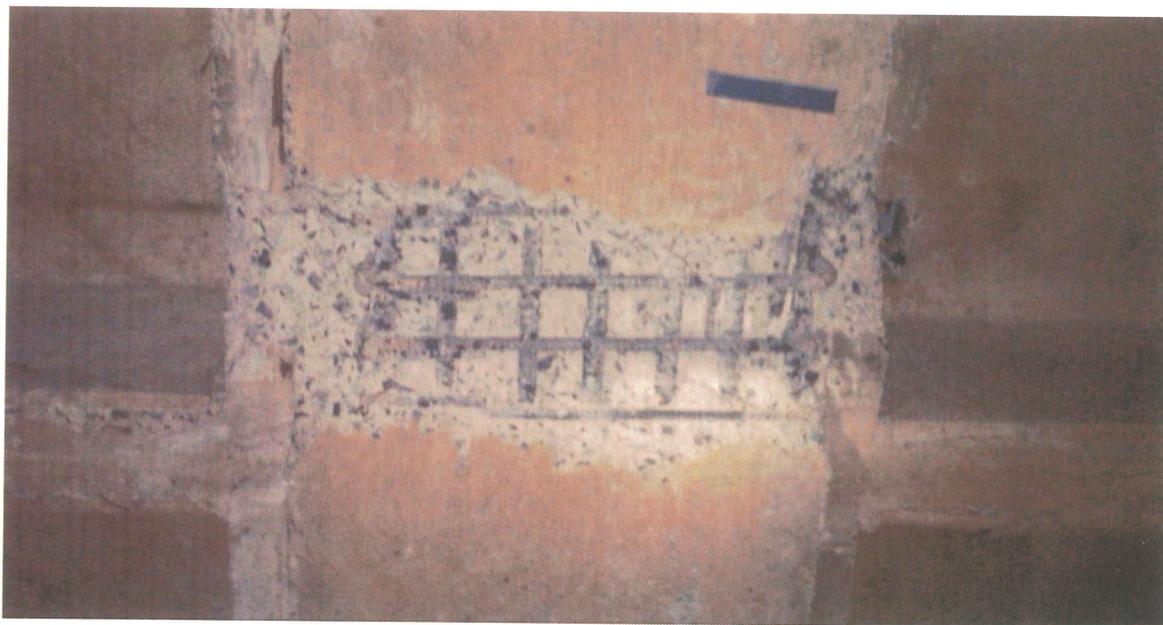
The beams that have thus far been found to be deficient are repairable. The most practical means of repair is carbon fiber reinforcement applied to and/or installed within the deficient beams to develop the required strength. OWPR is coordinating with

Montgomery County Public Schools and their project manager, MBP, to provide information needed to prepare cost estimates and schedules for modifications. The number of beams and columns in the building requiring modification, and subsequently the cost and installation time, will not be known until all in-place testing is complete. As in-place testing continues, it is probable that additional concrete beams that require remediation will be found.

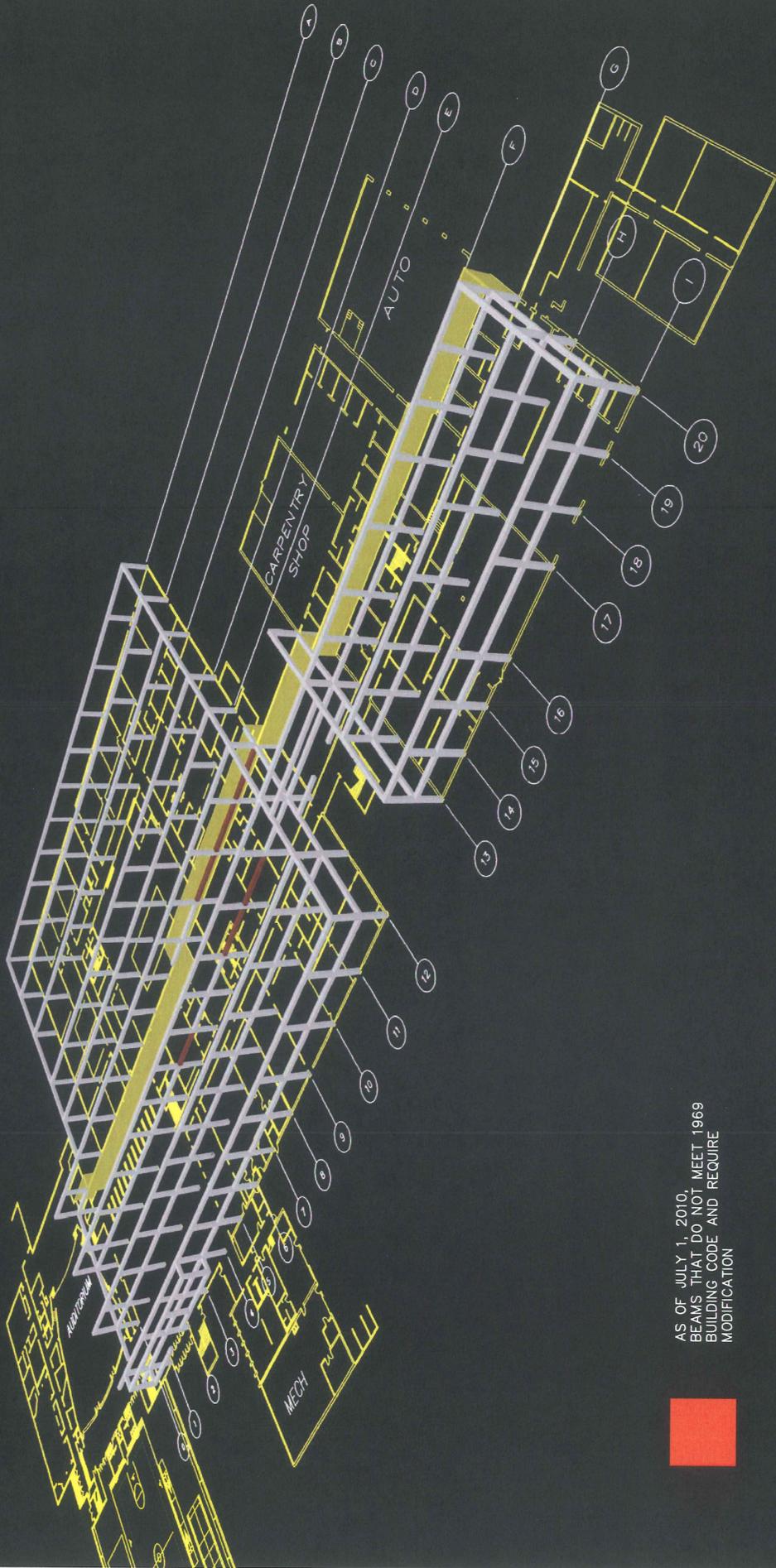
Following are examples of the findings for two of the beams that have thus-far been determined to be deficient. *It should be noted that we know that design changes occurred during construction, but we do not have documentation of what those changes were:*

**Beam G10-G11:** Per the design documents available to us, the beam was supposed to be 48" wide x 20" deep with (11) #10 bars as bottom steel. As-built conditions were verified as 24" wide x 32 ½" deep with (6) #6 bars. OWPR's analysis indicates that the anticipated loading (per 1969 Building Code) exceeds the calculated mid-span capacity by 63%.

**Beam F9-F10:** We have a change proposal that states that the design was changed, but no description of the change. As-built conditions were verified as 24" wide x 19 ½" deep with (3) #6 bars and (4) #7 bars as bottom steel, then a second layer of (3) #6 bars just above the bottom steel. OWPR's analysis indicates that the anticipated loading (per 1969 Building Code) exceeds the calculated mid-span capacity by 116%. Following is a picture of the beam's bottom reinforcing steel after destructive testing was performed.



Montgomery County Public Schools -  
Perspective of Concrete Structural  
Frame of Blacksburg High School



AS OF JULY 1, 2010,  
BEAMS THAT DO NOT MEET 1969  
BUILDING CODE AND REQUIRE  
MODIFICATION



# Executive Summary

ATS International, Inc. (ATS) was retained by Montgomery County Public Schools (MCPS) to conduct a geophysical investigation at the Blacksburg High School. This study was initiated in response to the collapse of the school's gymnasium in February of this year. In addition to this collapse, other areas of foundation settling have been observed with associated structural issues. The objectives of the survey were to use geophysical methods as a means of non-destructive testing to gain information of the earth beneath the concrete floors and the underlying earth both inside and outside of the school building. To meet these objectives, a combination of electrical resistivity imaging and ground penetrating radar (GPR) was used.

Prior to this study, several other subsurface investigations have been conducted at the site. ATS reviewed these studies, which included a geotechnical report for the original building design conducted in 1970 by LAW Engineering and Testing Company, as well as a subsequent investigations conducted by F&R, Inc. (2000) and Schnabel Engineering (2010). Throughout these three investigations, a total of 25 subsurface borings were conducted. The results of these borings were integrated into the findings of this investigation.

The site was constructed on the Copper Ridge Formation. Only the central member of this formation is prone to karst formation where it tends to form weak, discontinuous solution features. Law Engineering and Testing Company (1970) revealed some solutionally enlarged joints that had been filled with clay. This is consistent with other observations in the geotech report in which highly irregular depth to rock was encountered during drilling, another common karst feature. These features are consistent with observations made in the resistivity data. The resistivity sections are characterized by a thin veneer of low resistivity soil underlain by high resistivity rock. This rock is generally characterized by vertical low-resistivity areas that are consistent with the description by Law Engineering where the author describes "Joints in the original rock have been enlarged to slots by solution, and filled with the residual clay". This scenario appears to be common among the resistivity profiles where numerous discrete, nearly vertical low-resistivity features are found within the high resistivity rock.

The Schnabel Engineering report of 2010 indicates that the settling in the Wood Shop area and resulting wall cracks were noted within the first seven to eight years after construction. The report also indicates that the wall cracks were subsequently monitored with gauges, and that little to no additional movement of the cracks was observed. This behavior is not consistent with a geologic cause to the settlement resulting from the continued raveling of soils into deeper solution features. Continued raveling of soils into the subsurface would likely result in on-going settlement. If the settlement has not been on-going, then soils are not likely to be continuing to ravel.

There is no evidence on the resistivity data that the solutioning is connected to larger subsurface caverns. Most of the low-resistivity features within the building are more suggestive of alternating rock pinnacles and soil cutters than of large-scale voids that would pose a risk of future karst hazards. However, there are a few features that are observed in the resistivity data from outside of the building that warrant additional investigation to determine if they represent

large voids. Specifically, large voids that contain raveled soils would be expected to be characterized by spherical or oval low-resistivity features surrounded by higher resistivity rock. Such features are present on Line 5 beneath electrode locations 5-19, 5-30, and 5-35. A similar feature is observed on Line 1 beneath 1-23. We recommend additional borings at these locations with the goal of determining whether these features represent karst hazards with the potential for continued raveling of soils and resulting settlement. If the boring data indicate the absence of such features, then there is a low likelihood that there is a geologic hazard for the areas beneath the building.

We recommend that the additional borings be conducted with air-rotary, coring, or other methods capable of penetrating rock. We also recommend that the borings be advanced to approximately 50 feet in order to penetrate the rock and determine if the underlying low-resistivity features contain void space or raveled soils.

We recommend that the additional borings be conducted with air-rotary, coring, or other methods capable of penetrating rock. We also recommend that the borings be advanced to approximately 50 feet in order to penetrate the rock and determine if the underlying low-resistivity features contain void space or raveled soils.

The GPR study was conducted on several areas where subsidence had been observed to have occurred. The GPR study revealed that in one or more of those areas the soil had subsided beneath the slab, and revealed several locations of potential or likely voids. Subsequent invasive testing confirmed the presence of voids at those locations. The GPR study was conducted as a shallow survey to evaluate the conditions beneath the building slab. Therefore, no conclusions can be drawn from it with regard to the presence of deeper geologic features.