Earlham College
Science Complex - Phase 2

Conformed Set - Volume 1
February 28, 2014

boora

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ANY DONCHE REGISTERED ARCHITECT
AR11200006
STATE OF INDIANA

Earlham College Science Complex
Phase 2

801 National Road West
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REV.	DATE	DESCRIPTION

Issued: February 28, 2014

Scale:

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CONFORMED SET

COVER SHEET - VOLUME 1

CS.1

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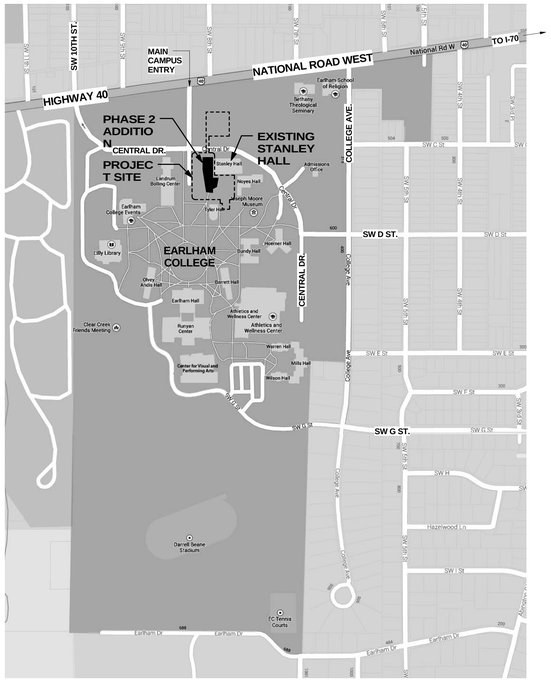
Grand total: 106		

VICINITY MAP



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Earlham College Science Complex Phase 2

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Richmond, IN 47374-4095

REV.	DATE	DESCRIPTION
3	01.29.2014	Addendum 3
2	01.15.2014	Addendum 2
1	01.03.2014	Add'm 1 Stanley Hall

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Scale: 12" = 1'-0"

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CONFORMED SET

OVERALL SHEET INDEX

G001

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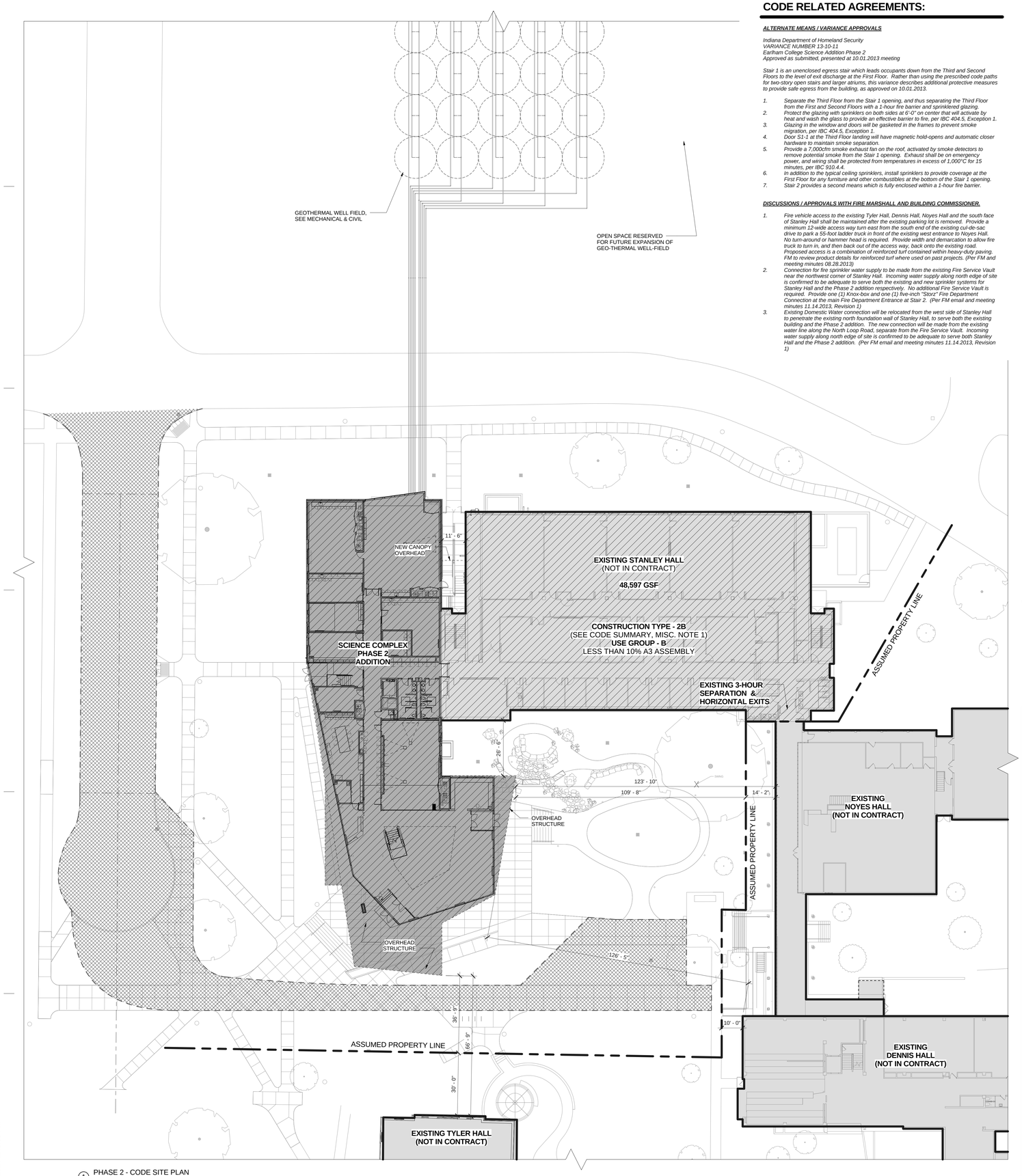

1 PHASE 2 - CODE SITE PLAN
1" = 20'-0"

RECORD OF FIRE MARSHAL AND CODE RELATED AGREEMENTS:

ALTERNATE MEANS / VARIANCE APPROVALS

Indiana Department of Homeland Security
VARIANCE NUMBER 13-10-11
Earlham College Science Addition Phase 2
Approved as submitted, presented at 10.01.2013 meeting

Stair 1 is an unenclosed egress stair which leads occupants down from the Third and Second Floors to the level of exit discharge at the First Floor. Rather than using the prescribed code paths for two-story open stairs and larger atriums, this variance describes additional protective measures to provide safe egress from the building, as approved on 10.01.2013.

1. *Separate the Third Floor from the Stair 1 opening, and thus separating the Third Floor from the First and Second Floors with a 1-hour fire barrier and sprinklered glazing.*
2. *Protect the glazing with sprinklers on both sides at 6'-0" on center that will activate by heat and wash the glass to provide an effective barrier to fire, per IBC 404.5, Exception 1.*
3. *Glazing in the window and doors will be gasketed in the frames to prevent smoke migration, per IBC 404.5, Exception 1.*
4. *Door S1-1 at the Third Floor landing will have magnetic hold-opens and automatic closer hardware to maintain smoke separation.*
5. *Provide a 7,000cfm smoke exhaust fan on the roof, activated by smoke detectors to remove potential smoke from the Stair 1 opening. Exhaust shall be on emergency power, and wiring shall be protected from temperatures in excess of 1,000°C for 15 minutes, per IBC 910.4.4.*
6. *In addition to the typical ceiling sprinklers, install sprinklers to provide coverage at the First Floor for any furniture and other combustibles at the bottom of the Stair 1 opening.*
7. *Stair 2 provides a second means which is fully enclosed within a 1-hour fire barrier.*

DISCUSSIONS / APPROVALS WITH FIRE MARSHALL AND BUILDING COMMISSIONER.

1. *Fire vehicle access to the existing Tyler Hall, Dennis Hall, Noyes Hall and the south face of Stanley Hall shall be maintained after the existing parking lot is removed. Provide a minimum 12-wide access way turn east from the south end of the existing cul-de-sac drive to park a 55-foot ladder truck in front of the existing west entrance to Noyes Hall. No turn-around or hammer head is required. Provide width and demarcation to allow fire truck to turn in, and then back out of the access way, back onto the existing road. Proposed access is a combination of reinforced turf contained within heavy-duty paving. FM to review product details for reinforced turf where used on past projects. (Per FM and meeting minutes 08.28.2013)*
2. *Connection for fire sprinkler water supply to be made from the existing Fire Service Vault near the northwest corner of Stanley Hall. Incoming water supply along north edge of site is confirmed to be adequate to serve both the existing and new sprinkler systems for Stanley Hall and the Phase 2 addition respectively. No additional Fire Service Vault is required. Provide one (1) Knox-box and one (1) five-inch "Storz" Fire Department Connection at the main Fire Department Entrance at Stair 2. (Per FM email and meeting minutes 11.14.2013, Revision 1)*
3. *Existing Domestic Water connection will be relocated from the west side of Stanley Hall to penetrate the existing north foundation wall of Stanley Hall, to serve both the existing building and the Phase 2 addition. The new connection will be made from the existing water line along the North Loop Road, separate from the Fire Service Vault. Incoming water supply along north edge of site is confirmed to be adequate to serve both Stanley Hall and the Phase 2 addition. (Per FM email and meeting minutes 11.14.2013, Revision 1)*

CODE LEGEND

NNO — NOT NORMALLY OCCUPIED - ACCESSORY USE AREAS EXCLUDED FROM BUILDING OCCUPANT LOAD CALCULATIONS

ROOM/OCCUPANCY LABEL

B — OCCUPANCY GROUP
Room — ROOM NAME
170 SF — OCCUPIED FLOOR AREA
15SF/ Occ — OCCUPANCY LOAD FACTOR
12 Occ. — OCCUPANT LOAD
1 Exit(s) Req. — NUMBER OF EXITS REQUIRED

ROOM OR SPACE EXIT SYMBOL

OCC: 17 — NUMBER OF OCCUPANTS EXITING FROM SPACE
A — GROUP REFERENCE (IF APPLIES)
WID: 19" — REQUIRED WIDTH OF EXIT BASED ON OCC. X CODE REQ (PER SECTION 1005.1)
ACTUAL: 34" — ACTUAL WIDTH OF EXIT MINUS ENCROACHMENT

SUITE OR FLOOR EXIT SYMBOL

OCC: 31 — COMBINED NUMBER OF OCCUPANTS EXITING SUITE OR FLOOR
A — GROUP REFERENCE
WID: 27" — REQUIRED WIDTH OF EXIT BASED ON OCC. X CODE REQ (PER SECTION 1005.1)
ACTUAL: 34" — ACTUAL WIDTH OF EXIT MINUS ENCROACHMENT

BUILDING EXIT SYMBOL

OCC: 64 — COMBINED NUMBER OF OCCUPANTS EXITING BUILDING
A — GROUP REFERENCE
WID: 41" — REQUIRED WIDTH OF EXIT BASED ON OCC. X CODE REQ (PER SECTION 1005.1)
ACTUAL: 68" — ACTUAL WIDTH OF EXIT MINUS ENCROACHMENT

FIRE SEPARATION RATING

1-HOUR FIRE PARTITION
1-HOUR FIRE BARRIER
2-HOUR FIRE BARRIER OR FIRE WALL
3-HOUR FIRE BARRIER OR FIRE WALL
4-HOUR FIRE BARRIER OR FIRE WALL

FEC — FIRE EXTINGUISHER CABINET VERIFY LOCATIONS W/ FM AND ARCHITECT

MAXIMUM EXIT TRAVEL DISTANCE

EXIT SIGNAGE SYMBOLS

AREA OF RESCUE ASSISTANCE

NOT REQUIRED, per Indiana Amendment 675 IAC 13-2.5-11 Chapter 10; means of egress
(6) Amend Section 1007.3. Exit stairways, as follows:
(A) Add a new Exception number 4 to read as follows:
Areas of refuge are not required at exit stairways in buildings or facilities equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

5'-0" TURNING DIAMETER

PLUMBING FIXTURE CALCULATIONS:

NOTES:

1. PLUMBING FIXTURE CALCULATIONS PER 675 IAC 13-2.5-28 / (2) SECTION 2902.2.
2. PLUMBING FIXTURE CALCULATIONS INCLUDE OCCUPANTS OF BOTH EXISTING STANLEY HALL AND PHASE 2 ADDITION.
3. NOTE THAT REFERENCED "Table 10-A" WAS NOT FOUND, RATHER OCCUPANCY LOAD FACTORS ARE TAKEN FROM 2006 IBC TABLE 1004.1.1. (CONFIRMED PER EMAIL FROM INDIANA DHS, 01.30.2013.)
4. PLUMBING FIXTURE COUNT BASED ON TABLE 29 OF INDIANA ADMINISTRATIVE CODE / TITLE 675 / ARTICLE 13
5. THERE ARE SIX (6) DRINKING FOUNTAINS TO BE PROVIDED NEAR THE RESTROOMS OF THE PHASE 2 ADDITION. THERE ARE SEVEN (7) EXISTING DRINKING FOUNTAINS IN STANLEY HALL. IN ORDER TO MEET THE CALCULATED FIFTEEN (15) FIXTURES, THE PHASE 2 ADDITION ALSO PROVIDES TWO (2) WATER BOTTLE STATIONS NEAR VESTIBULE 1 - 100A AND THE MATH STUDIO 221. SEE PLUMBING.

EXISTING STANLEY HALL	Usable (Net) Floor Space	Occupant Load Factor	Plumbing (Education)	Occupant Load (Lecture Hall)
BASEMENT				
Acc. Storage / Mech. Equip.	6,710 SF	1/300	22.4	
Assembly A3 - Fixed Seats	N/A	SEATS		= 63
Educational Shops/Vocation (Labs)	4,697 SF	1/50	93.9	
FIRST FLOOR				
Acc. Storage / Mech. Equip.	890 SF	1/300	3.0	
Business Areas	1,438 SF	1/100	14.4	
Educational Classrooms	765 SF	1/20	38.3	
Educational Shops/Vocation (Labs)	7,125 SF	1/50	142.5	
SECOND FLOOR				
Acc. Storage / Mech. Equip.	1,209 SF	1/300	4.0	
Business Areas	1,165 SF	1/100	11.7	
Educational Classrooms	266 SF	1/20	13.3	
Educational Shops/Vocation (Labs)	7,602 SF	1/50	152.0	
			= 495.4	

PHASE 2 ADDITION	Usable (Net) Floor Space	Occupant Load Factor	Plumbing (Education)	Occupant Load (Lecture Hall)
BASEMENT				
Acc. Storage / Mech. Equip.	1 2,037 SF	1/300	6.8	1 N/A
FIRST FLOOR				
Acc. Storage / Mech. Equip.	32 SF	1/300	0.1	
Business Areas	1,072 SF	1/100	10.7	
Educational Classrooms	4,584 SF	1/20	229.2	
Educational Shops/Vocation (Labs)	2,573 SF	1/50	51.5	
SECOND FLOOR				
Acc. Storage / Mech. Equip.	85 SF	1/300	0.3	
Business Areas	2,501 SF	1/100	25.0	
Educational Classrooms	3,656 SF	1/20	182.8	
Educational Shops/Vocation (Labs)	2,550 SF	1/50	51.0	
THIRD FLOOR				
Acc. Storage / Mech. Equip.	192 SF	1/300	0.6	
Business Areas	722 SF	1/100	7.2	
Educational Classrooms	7,523 SF	1/20	376.2	
			= 941.4 1	

COMBINED TOTAL PLUMBING OCCUPANTS

EDUCATIONAL OCCUPANCY		LECTURE HALL OCCUPANCY	
495.4	EXISTING STANLEY HALL	= 63	EXISTING STANLEY HALL ONLY
1 + 941.4	PHASE 2 ADDITION		
= 1,436.8	COMBINED TOTAL		

OCCUPANCY	Plumbing Occupants Total	Men	Women	Occupant Load Factors & Req. Fixtures per Occupant: Water Closets & Urinals Men	Water Closets & Urinals Women	Lavatories Men	Lavatories Women	Drinking Fountains * (All occupants)
Lecture Hall	63	32	32	1/125 **0.25**	1/65 **0.48**	1/200 **0.16**	1/200 **0.16**	1/1000 **0.06**
Education	1,437	719	719	1/50 **14.38**	1/50 **14.38**	1/50 **14.38**	1/50 **14.38**	1/100 **14.37**
Total Fixtures Required				**= 14.63 (15)**	**= 14.86 (15)**	**= 14.54 (15)**	**= 14.54 (15)**	**= 14.43 (15)**
Existing Stanley Hall - Actual Fixtures				12	12	9	9	7
Phase 2 Addition - Actual Fixtures				+ 9	+ 9	+ 6	+ 6	+ 8 *
Combined Total - Fixtures Provided				**= 21**	**= 21**	**= 15**	**= 15**	**= 15**

* SEE NOTE 5 ABOVE

CODE SUMMARY:

APPLICABLE CODES:

2008 INDIANA BUILDING CODE (2006 IBC WITH AMENDMENTS)
2008 INDIANA MECHANICAL CODE (2006 IMC WITH AMENDMENTS)
2012 INDIANA PLUMBING CODE
2009 INDIANA ELECTRICAL CODE (2008 NFPA 70 WITH AMENDMENTS)
2008 INDIANA FIRE CODE (2006 IFC WITH AMENDMENTS)
2010 INDIANA ENERGY CONSERVATION CODE (2007 ASHRAE 90.1 WITH AMENDMENTS)
US ADAAG ACCESSIBILITY GUIDELINES

USE GROUP AND OCCUPANCY

EXISTING STANLEY HALL (PHASE 1) *Per 04.27.2012 PERMIT SET by others.*

BUSINESS GROUP B: (IBC Section 304)
Educational Occupancies for Students above the 12th Grade

ASSEMBLY GROUP A3 *: (IBC Section 303)
Lecture Hall

* ACCESSORY OCCUPANCIES: (IBC Section 508.3.1)
Less than 10% Assembly A3 area per floor;
Not to exceed areas per Table 503 without increases

PHASE 2 ADDITION

BUSINESS GROUP B: (IBC Section 304)
Faculty Offices; Educational Classrooms above the 12th grade;
Study Rooms, Laboratories & support space for scientific research

CONSTRUCTION TYPE

EXISTING STANLEY HALL:
Type 2B* - Automatic Sprinkler System *(*See Misc. Note 1)* (IBC Table 602) (IBC Section 903.2.1.3)

PHASE 2 ADDITION:
Type 2B - Automatic Sprinkler System

ALLOWABLE HEIGHT AND AREA

ALLOWABLE BUILDING HEIGHT:	(2) Stories up to 55'-0"	(IBC Table 503)
ALLOWABLE AREA PER STORY:	23,000 SF	
ALLOWABLE HEIGHT INCREASE:	Add (1) Story and 20'-0" with Automatic Sprinkler System	
TOTAL ALLOWABLE BUILDING HEIGHT:	(3) Stories up to 75'-0"	(IBC Section 504.2)

ALLOWABLE FLOOR AREA INCREASES *Includes combined frontage calculation for Phases 1 & 2*

ALLOWABLE FLOOR AREA:	23,000 SF	(IBC Table 503)
FRONTAGE INCREASE:	+ [23,000 X 0.54] SF	(IBC Section 506.2)
SPRINKLER SYSTEM INCREASE:	+ [23,000 X 2] SF	(IBC Section 506.3)
ALLOWABLE AREA PER SINGLE STORY:	= 81,420 SF	
BUILDING AREA DETERMINATION:	[81,420 X 3] SF	(IBC 506.4)
TOTAL ALLOWABLE BUILDING AREA: (FOR TYPE 2B CONSTRUCTION)	**= 244,260 SF**	

ACTUAL FLOOR AREAS	EXISTING STANLEY HALL	PHASE 2 ADDITION
BASEMENT AREA:	16,199 SF	2,429 SF 1
FIRST FLOOR AREA:	16,199 SF	12,579 SF
SECOND FLOOR AREA:	16,199 SF	14,187 SF
THIRD FLOOR AREA:	N/A	12,495 SF
ACTUAL FLOOR AREA, PER PHASE:	= 48,597 SF	= 41,690 SF
COMBINED TOTAL FLOOR AREA:		1 **= 90,287 SF** < ALLOWABLE
ACTUAL BUILDING HEIGHTS:	(2) Stories @ 35'-0"	(3) Stories @ 47'-4"

FIRE RESISTIVE REQUIREMENTS

STRUCTURAL FRAME:	0* HR	(IBC Table 601)
EXTERIOR BEARING WALLS:	0 HR	
INTERIOR BEARING WALLS:	0 HR	
EXTERIOR NONBEARING WALLS:	0 HR	
INTERIOR NONBEARING WALLS:	0 HR	
FLOOR CONSTRUCTION:	0 HR	
ROOF CONSTRUCTION:	0 HR	
** The fire-resistance rating of structural members and assemblies shall comply with the requirements for the type of construction and shall not be less than the rating required for the fire-resistance-rated assemblies supported.*		* (IBC 714.1) ** REFER TO SHEET G110 FOR EXTENT OF FIRE-PROOFING*
FIRE SEPARATION DISTANCE:		
EXTERIOR WALLS CLOSER THAN 10'-0":	1 HR	(IBC Table 602)
EXTERIOR WALLS FURTHER THAN 10'-0":	0 HR	
SHAFT ENCLOSURES CONNECTING -		
- LESS THAN (4) STORIES:	1 HR	(IBC Section 707.4)
- (4) STORIES OR MORE:	2 HR	
1 CORRIDOR FIRE RESISTANCE RATING:	0 HR*	(IBC Table 1017.1) * Automatic Sprinkler System

INCIDENTAL USE AREAS

FURNACE ROOMS OVER 400,000 BTU/H INPUT:	0 HR*	(IBC Table 508.2)
BOILER ROOMS OVER 15 PSI & 10 HORSEPOWER:	0 HR*	
REFRIGERANT MACHINERY ROOMS:	0 HR*	
STORAGE ROOMS LARGER THAN 100 SF:	0 HR*	

NOTE: * With Automatic Sprinkler System installed, Fire Barriers are not required around the Incidental Uses listed above. However, Smoke Separation is still required. (IBC Section 508.2.2.1)

1 **ROOM SIGNAGE:** REFER TO 2/A661

MISCELLANEOUS:

1. *Existing Stanley Hall was originally built in 1970, and recently renovated in 2013, permitted as Construction Type 2A. The existing construction of Stanley Hall exceeds minimum fire resistance requirements for Construction Type 2B. The proposed Science Complex Phase 2 addition reclassifies the combined Addition and existing Stanley Hall as Construction Type 2B. Since both portions of the building meet the requirements of Type 2B construction, no separation is required between the Existing building and the Phase 2 Addition. Calculations for the Allowable Height and Area, Egress Occupant Loads, and Plumbing Fixture Counts use the combined areas of both the Existing portion and the Addition as one building.*

CODE SITE PLAN LEGEND:

PHASE 2 ADDITION

EXISTING BUILDINGS

COMBINED AREA OF EXISTING STANLEY HALL & PHASE 2 ADDITION

APPROXIMATE AREA OF FIRE VEHICLE ACCESS. REFER TO RECORD OF FIRE MARSHAL AND CODE RELATED AGREEMENTS. SEE LANDSCAPE FOR EXTENT OF REINFORCED SURFACES.

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Earlham College Science Complex Phase 2

801 National Road West
Richmond, IN 47374-4095

REV.	DATE	DESCRIPTION
1	01.15.2014	Addendum 2

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CODE SUMMARY AND SITE PLAN

G002

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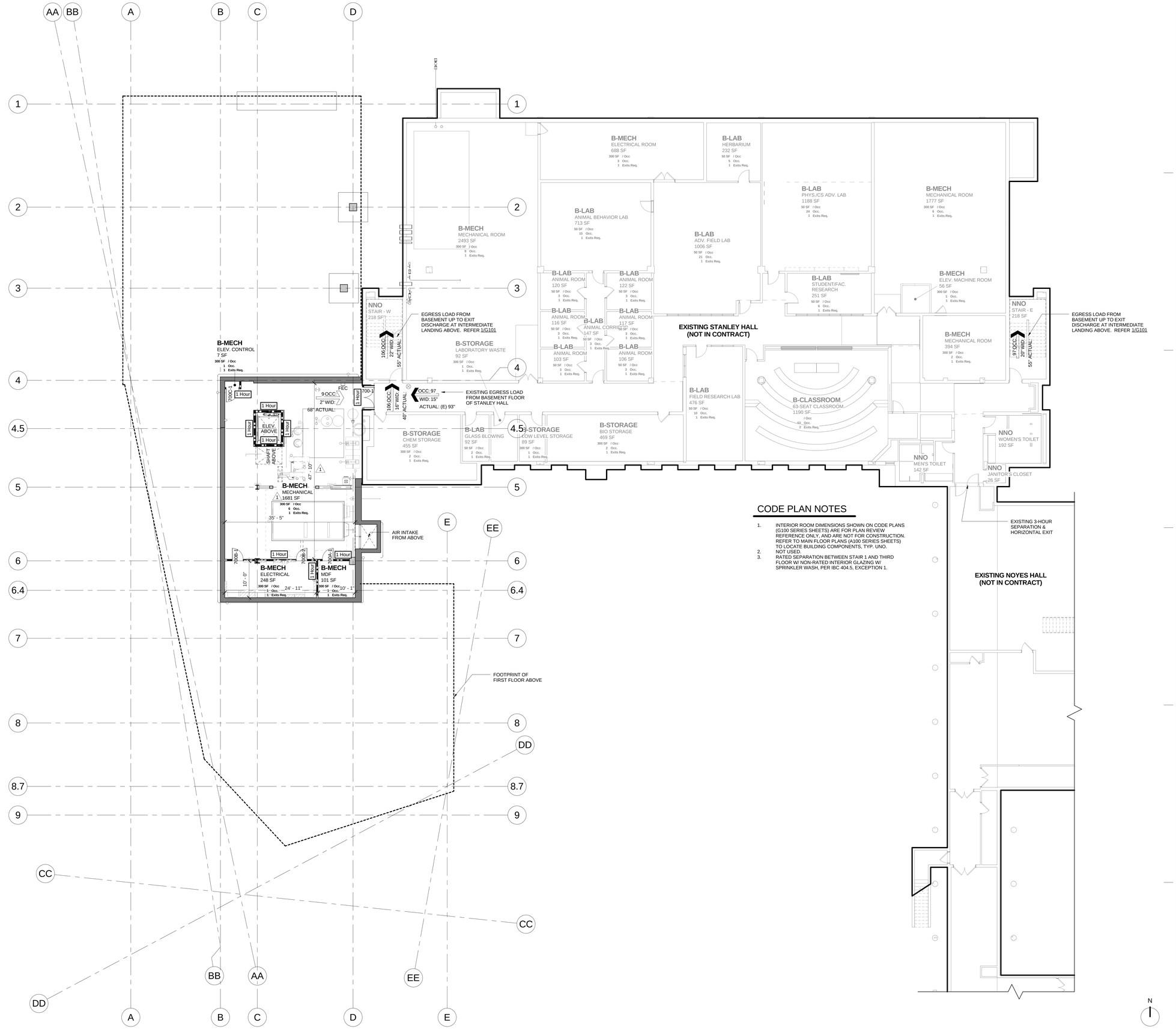

CODE PLAN NOTES

1. INTERIOR ROOM DIMENSIONS SHOWN ON CODE PLANS (G100 SERIES SHEETS) ARE FOR PLAN REVIEW REFERENCE ONLY, AND ARE NOT FOR CONSTRUCTION. REFER TO MAIN FLOOR PLANS (A100 SERIES SHEETS) TO LOCATE BUILDING COMPONENTS, TYP. UNO.
2. NOT USED.
3. RATED SEPARATION BETWEEN STAIR 1 AND THIRD FLOOR W/ NON-RATED INTERIOR GLAZING W/ SPRINKLER WASH, PER IBC 404.5, EXCEPTION 1.

1 PHASE 2 - BASEMENT CODE ANALYSIS PLAN
1" = 10'-0"

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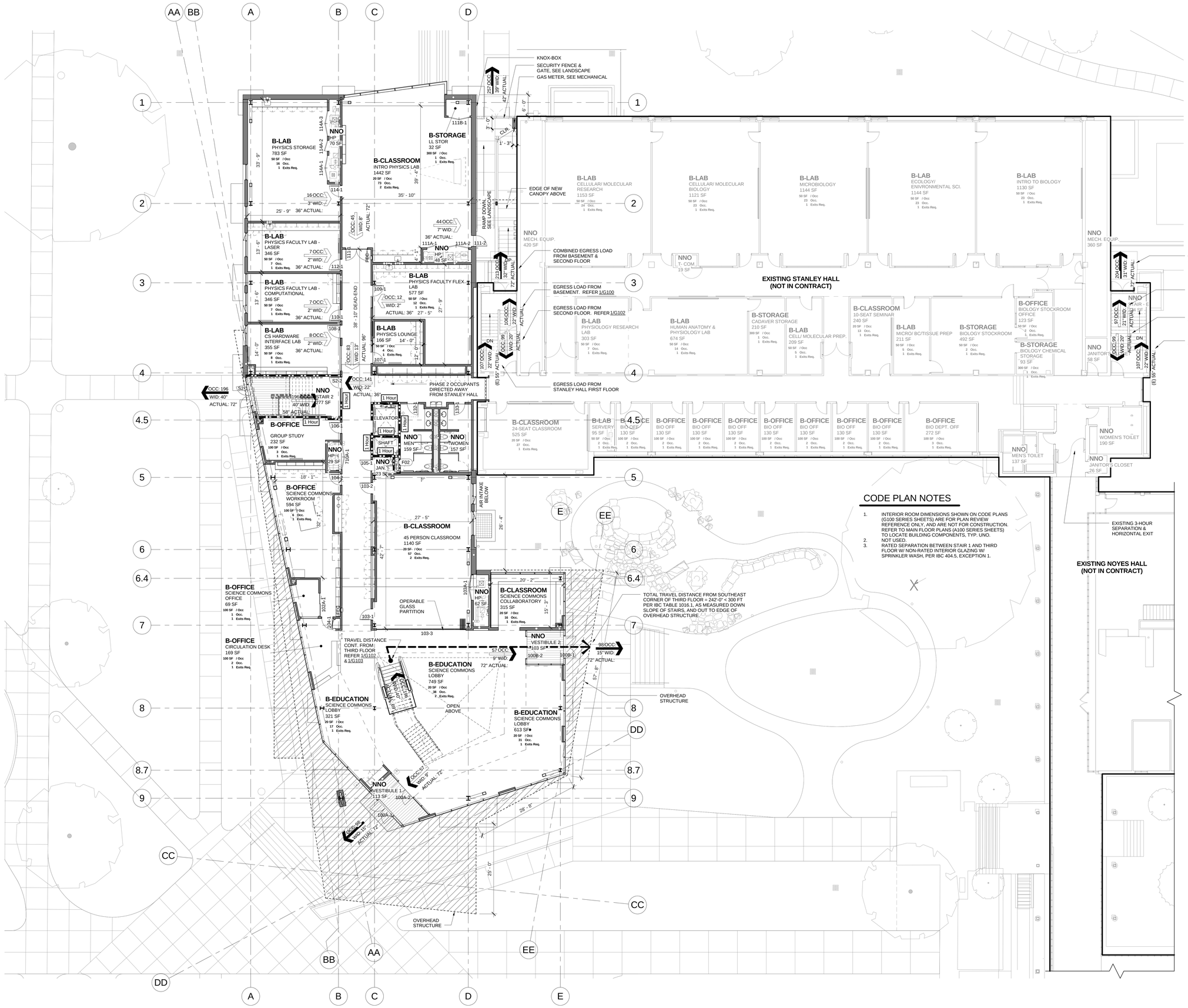
BASEMENT CODE ANALYSIS

G100



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1 PHASE 2 - FIRST FLOOR CODE ANALYSIS PLAN
1" = 10'-0"

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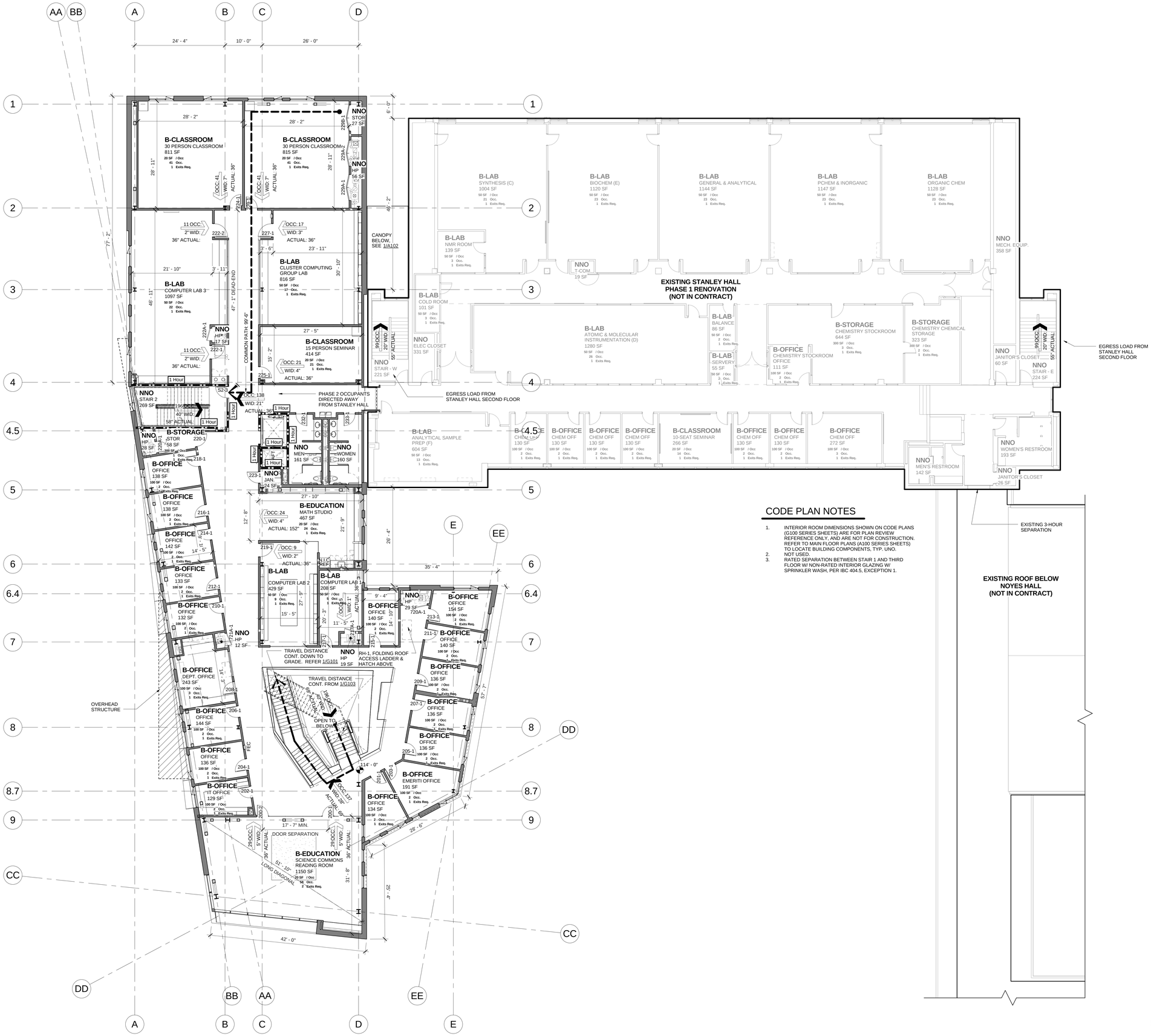
FIRST FLOOR CODE ANALYSIS

G101



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2. NOT USED.
3. RATED SEPARATION BETWEEN STAIR 1 AND THIRD FLOOR W/ NON-RATED INTERIOR GLAZING W/ SPRINKLER WASH, PER IBC 404.5, EXCEPTION 1.

1 PHASE 2 - SECOND FLOOR CODE ANALYSIS PLAN
1" = 10'-0"

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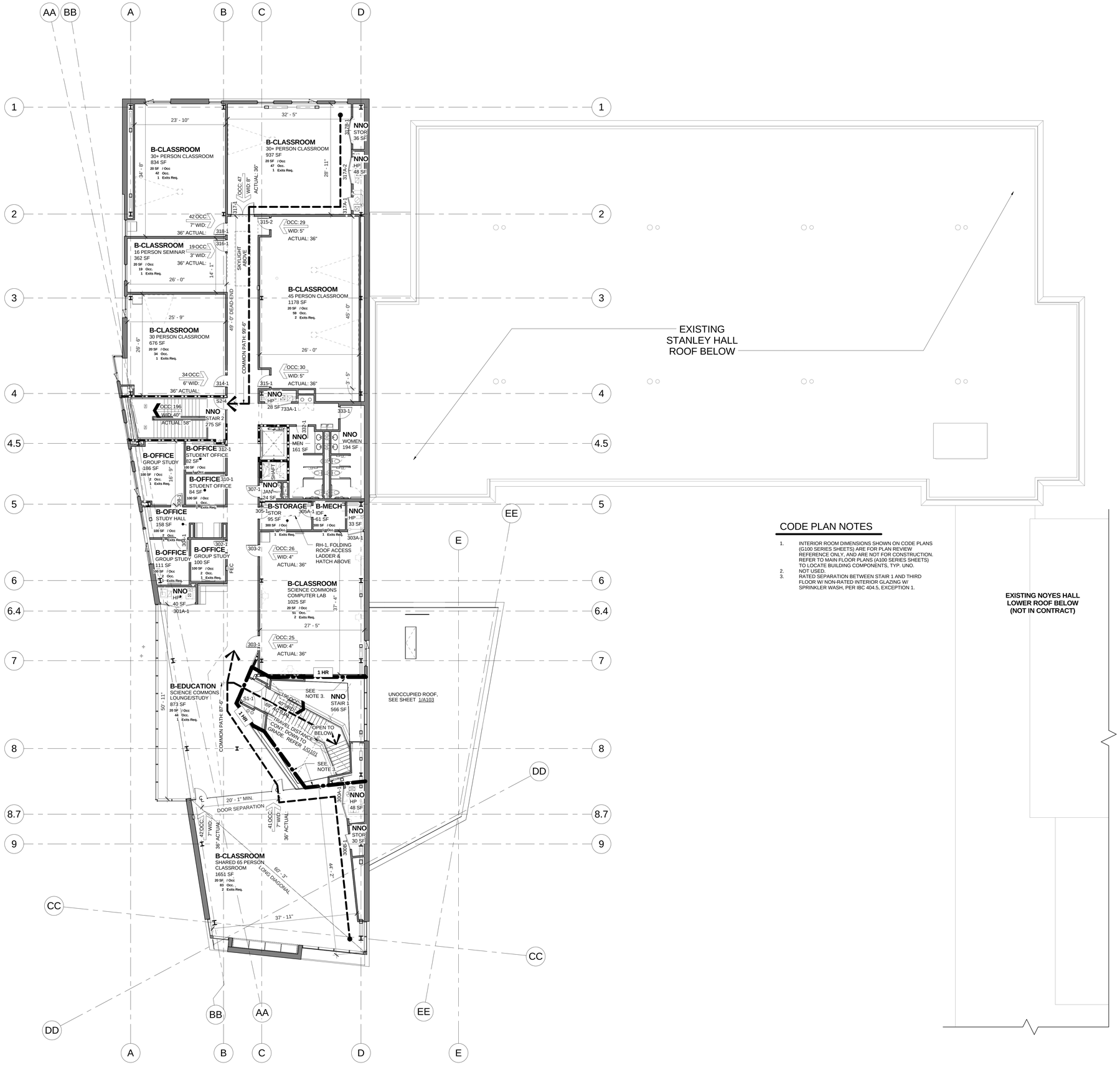
SECOND FLOOR CODE ANALYSIS

G102



CODE PLAN NOTES

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2. NOT USED.
3. RATED SEPARATION BETWEEN STAIR 1 AND THIRD FLOOR W/ NON-RATED INTERIOR GLAZING W/ SPRINKLER WASH, PER IBC 404.5, EXCEPTION 1.

1 PHASE 2 - THIRD FLOOR CODE ANALYSIS PLAN
1" = 10'-0"

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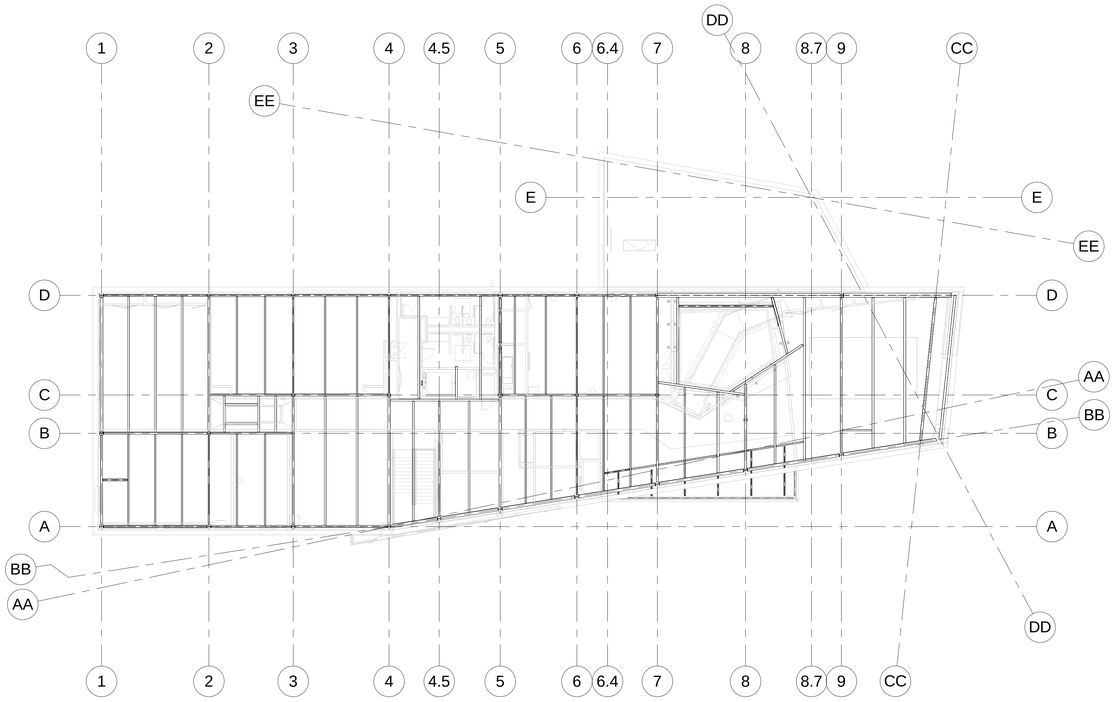
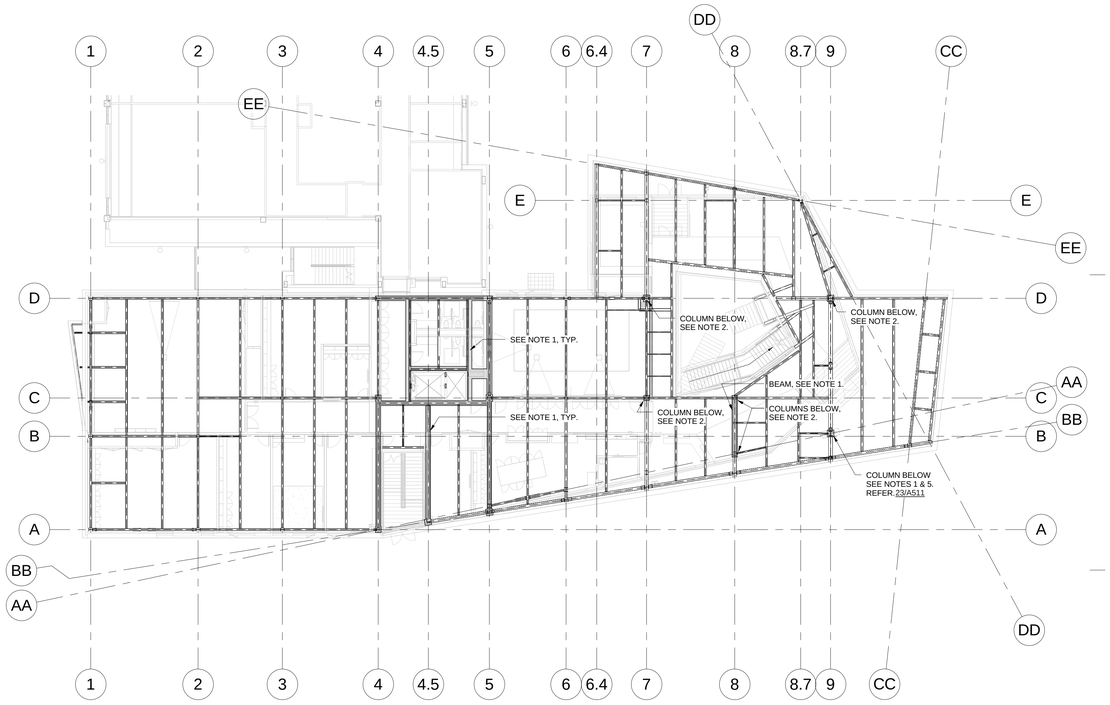
THIRD FLOOR CODE ANALYSIS

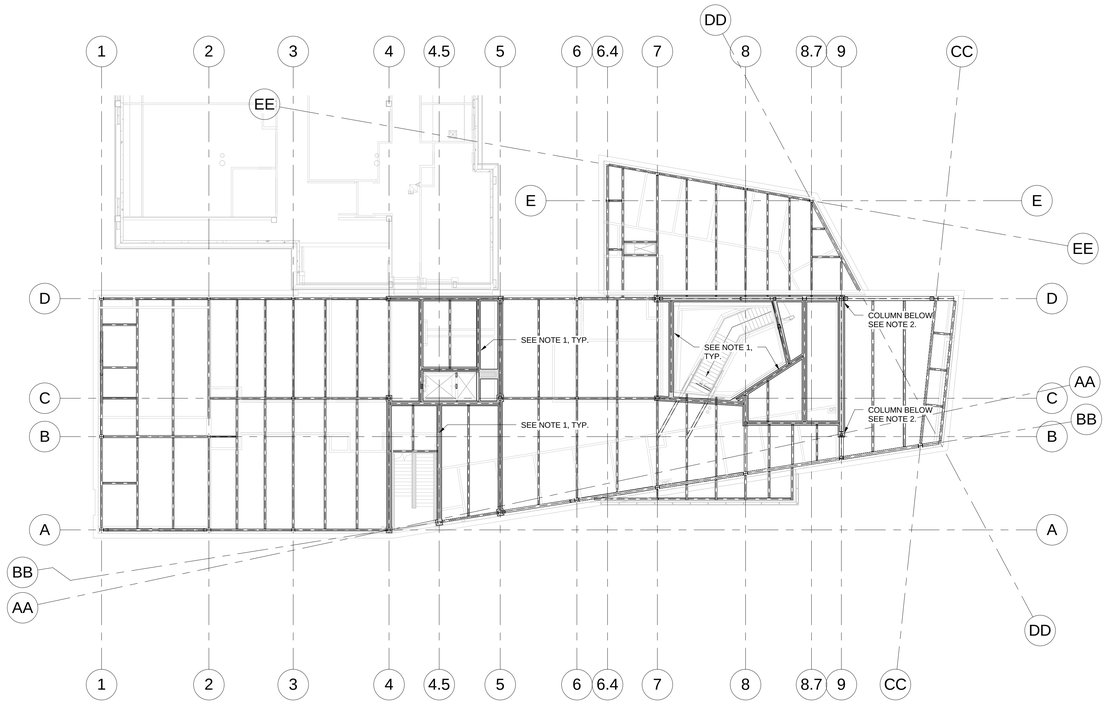
G103



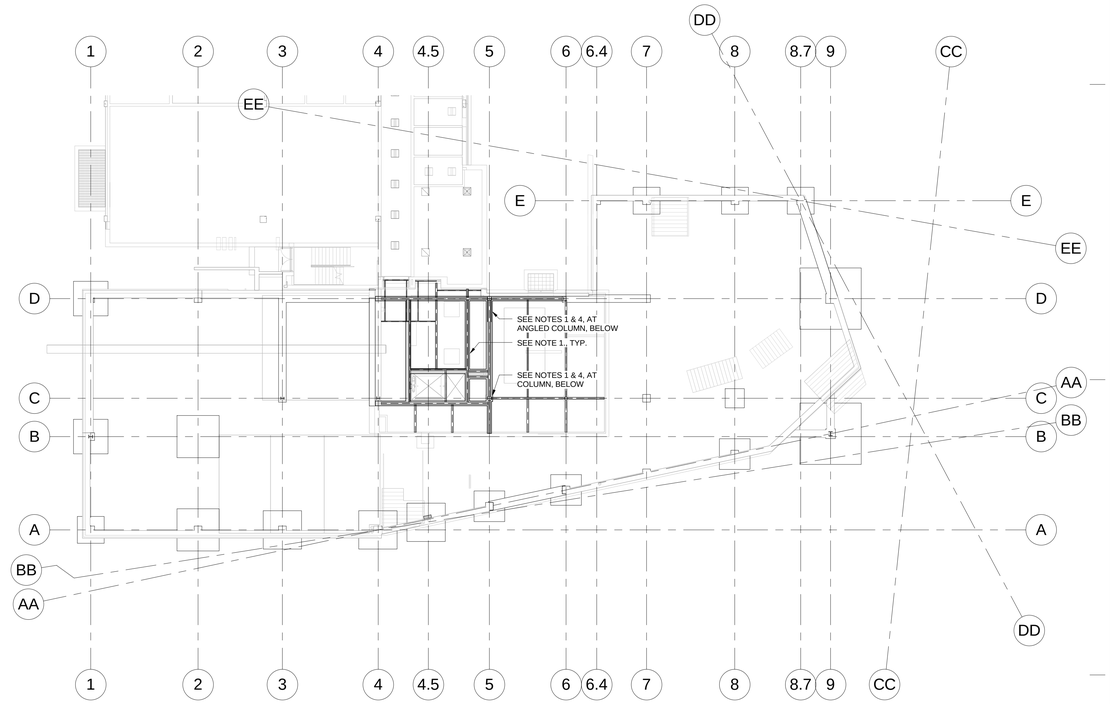
4 FIRE RATED STRUCTURE - ROOF FRAMING
1/16" = 1'-0"



2 FIRE RATED STRUCTURE - SECOND FLOOR FRAMING
1/16" = 1'-0"



3 FIRE RATED STRUCTURE - THIRD FLOOR FRAMING
1/16" = 1'-0"



1 FIRE RATED STRUCTURE - FIRST FLOOR FRAMING
1/16" = 1'-0"

FIRE RATED STRUCTURE LEGEND

EXTENT OF 1-HOUR FIRE PROTECTION OF STRUCTURE

FIRE RATED STRUCTURE NOTES

1. SPRAY-APPLIED FIREPROOFING AT STRUCTURE WHICH SUPPORTS RATED PARTITIONS. SEE CODE PLANS. SUPPORTING COLUMNS BELOW TO MATCH BEAM FIREPROOFING, TYP. UNO.
2. INTUMESCENT FIREPROOFING AT EXPOSED COLUMNS & CONNECTIONS AS REQUIRED.
3. FIREPROOFING TO MATCH OR EXCEED PROTECTION OF RATED WALLS WHICH ARE SUPPORTED, TYP.
4. WRAP COLUMN W/ FURRING WALL TYPE "01B3" W/ GYPSUM BOARD EXTENDING UP TO 9'-6" AFF, PTD "P-1" TYP.
5. APPLY ADDITIONAL THICKNESS OF FIREPROOFING (MIN. 4") FOR THERMAL RESISTANCE DOWN TO 4'-0" BELOW SOFFIT
6. FIRE-RATED STRUCTURE PLANS SHOW STRUCTURAL FRAMING AT EACH FLOOR LEVEL. PLAN VIEWS EXTEND DOWN TO SHOW SUPPORTING COLUMNS BELOW, TYP.

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FIRE-RATED STRUCTURE PLANS

G110