

Camp Dodge Building W-41 Wall Settlement Review

SBI Project No. 123.1220.03



Prepared by:



December 14, 2023

Prepared for:

Department of Public Defense
Armory Board, Iowa Army
National Guard



CAMP DODGE BUILDING W-41 WALL SETTLEMENT REVIEW

Prepared for:

Iowa Army National Guard
7105 NW 70th Ave, Bldg. 3465
Johnston, Iowa 50131

Shuck-Britson, Inc. Project No. 123.1220.03

Prepared by:

A handwritten signature in blue ink that reads 'Anna Siegrist'.

Anna Siegrist, P.E.
Structural Engineer

TABLE OF CONTENTS

	PAGE
Introduction.....	1
Existing Infrastructure Background.....	1
Field Observations	1
Recommendations.....	2
Conclusion	2

APPENDICES

Appendix A

Photographs.....	Exhibit A-1
Existing Plans.....	Exhibit A-2
Mud Jacking Location.....	Exhibit A-3

Introduction

An office building located on the Iowa National Guard Camp Dodge Campus in Johnston Iowa has an interior wall and slab that is settling. Shuck-Britson, Inc. has completed a review of the settling wall and slab and outlined a recommended repair. The purpose of this review is limited to the areas identified here.

Existing Infrastructure Background

Based on site observations and information provided by Iowa National Guard, the one-story office building, constructed in 1969 with an addition to the was constructed after was constructed of the following:

1. Steel joist roof spans east-west
2. Load bearing interior masonry run along the corridor.
3. The exterior walls are comprised of steel beams, concrete columns, and masonry walls.
4. The floor is a 4" slab on grade with carpet finishes.
5. A 6" return duct that serves one room runs along the exterior walls. According to the existing plans, this duct is insulated with a minimum of 3" concrete.
6. A 5'-8" roof overhang extends around the perimeter of the building, except at the south-west corner.
7. Downspouts with extensions or concrete splash blocks exist around the perimeter of the building.
8. The foundations are reinforced concrete.

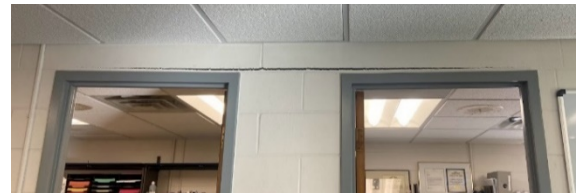


Field Observations

On September 29, 2023 and December 13th, Anna Siegrist, P.E. visited the W-41 building to observe the existing conditions. The field observations were limited to visual observations from around the perimeter of the building and from the interior. Due to the level of finishes in select areas and limited access, limited observations were made.

The following observations were noted during the site visit:

1. The south non-load bearing CMU wall to offices 118 and 117 has settled 3/8" above the two office doors. (Refer to photo 7 and 8).
2. Horizontal CMU cracks ranging from hairline to 1/8" wide exist on the north, east and south walls in office 117 and the north, south and west walls in office 118. (Refer to photos 9-12).
3. Vertical drywall cracks exist on the north wall of room 117. (Refer to photo 13).
4. The slab north of room 117 had settled approximately 11/16" and was sloping up to 1.8 degrees. (Refer to photos 14-15).
5. The slab east of room 113 had settled approximately 13/16" and was sloping up to 1.9 degrees. (Refer to photo 16-17).



Recommendations

Based on the observations, we make the following recommendation:

1. Mud jack the slab at the location of the south CMU wall to offices 118 and 117 where the settlement has measured 3/8" above the two office doors. See Exhibit A-3.
 - a. The slab is to be mud jacked until the crack in the wall is closed or visually appears as a hairline crack. Pull back any carpet finish as needed for access ports in the slab on grade. Grout all access holes solid and reinstall the carpet with fresh glue as required. Protect the surrounding area and finishes.
 - b. Route out the cracked mortar line, regrout and repaint the cracks.
 - c. The surrounding walls, slab, and roof joists are to be monitored during the mud jacking to ensure there is no unwanted subsequent movement, cracks, or conflicts beyond the intention to raise the settled portion of the slab and non-load bearing wall.
2. Mud jack the slab at the low point in the slab north of room 117 where the settlement has measured 11/16". See Exhibit A-3.
 - a. The slab is to be mud jacked until the slope of the slab is minimized. Pull back any carpet finish as needed for access ports in the slab on grade. Grout all access holes solid and reinstall the carpet with fresh glue as required. Protect the surrounding area and finishes.
 - b. The surrounding walls, slab, and roof joists are to be monitored during the mud jacking to ensure there is no unwanted subsequent movement, cracks, or conflicts beyond the intention to raise the settled portion of the slab.
3. Mud jack the slab at the low point in the slab east of room 113 where the settlement has measured 13/16". See Exhibit A-3.
 - a. The slab is to be mud jacked until the slope of the slab is minimized. Pull back any carpet finish as needed for access ports in the slab on grade. Grout all access holes solid and reinstall the carpet with fresh glue as required. Protect the surrounding area and finishes.
 - b. The surrounding walls, slab, and roof joists are to be monitored during the mud jacking to ensure there is no unwanted subsequent movement, cracks, or conflicts beyond the intention to raise the settled portion of the slab.

Conclusion

Based on these observations and recommendation, we offer the following conclusion. Mud jacking the slab would elevate the settling wall to minimize the crack in the CMU wall and the slope in the floor. There is a possibility that further settlement could occur following the mud jacking. If settlement is observed after the mud jacking, further investigation, including investigating the condition of the 6" return duct or a geotechnical exploration would be recommended.

This concludes the report for the Camp Dodge W-41 in Johnston, Iowa. If you have any additional questions regarding any of this information, or if we can be of further assistance, please contact our office at the phone number below.

Exhibit A-1 – Photographs



Photo 1: East elevation of the building looking west



Photo 2: North elevation of the building looking south



Photo 3: South elevation of the building looking north



Photo 4: South-west elevation of the building looking north



Photo 5: North-west elevation of the building looking east



Photo 6: Typical downspout with splash block



Photo 7: South wall of office 117 and 118 with 3/8" settlement above doors



Photo 8: South wall of office 117 and 118 with 3/8" settlement above doors



Photo 9: Horizontal CMU crack on office 118 south wall



Photo 10: Horizontal CMU crack on office 118 west wall

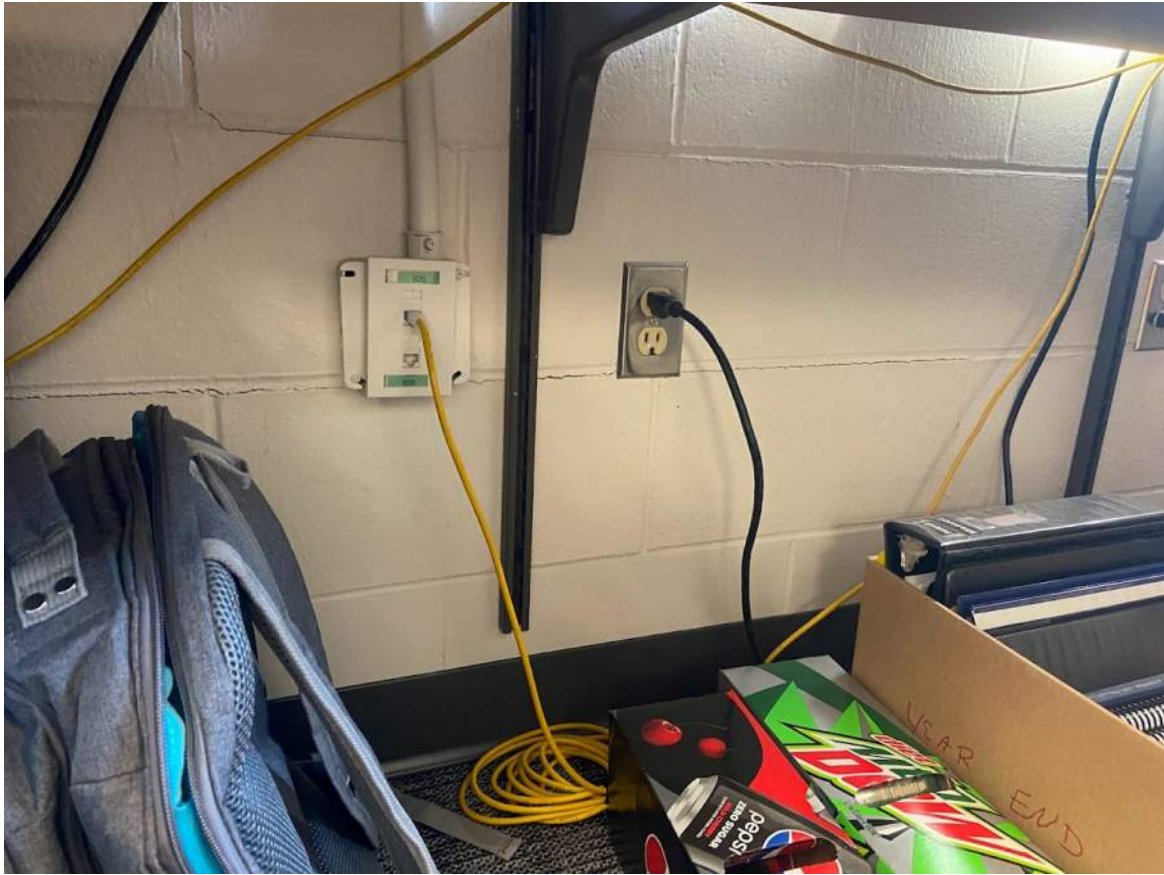


Photo 11: Horizontal CMU crack on office 118 north wall

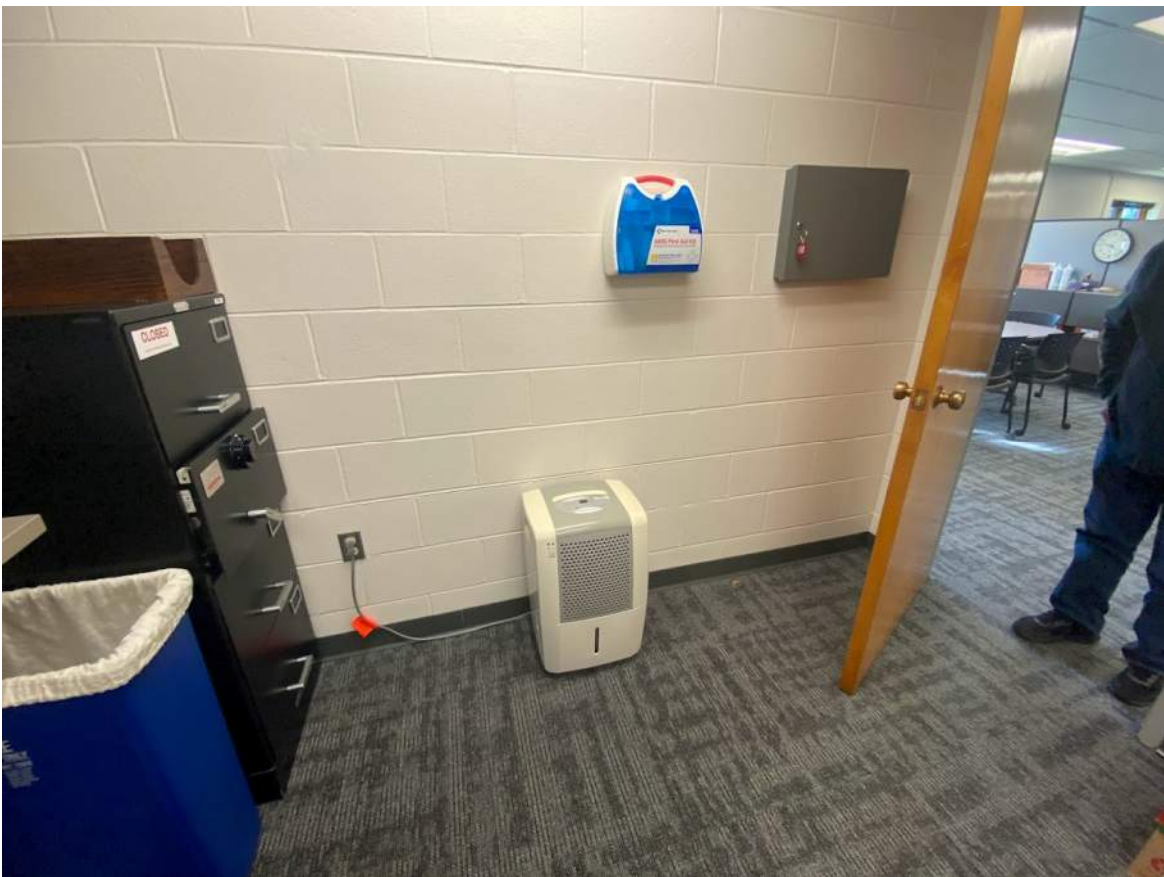


Photo 12: Horizontal CMU crack on office 117 east wall



Photo 13: Vertical drywall crack on the south wall of room 117



Photo 14: Sloped slab north of room 117



Photo 15: Sloped slab north of room 117



Photo 16: Sloped slab east of room 113



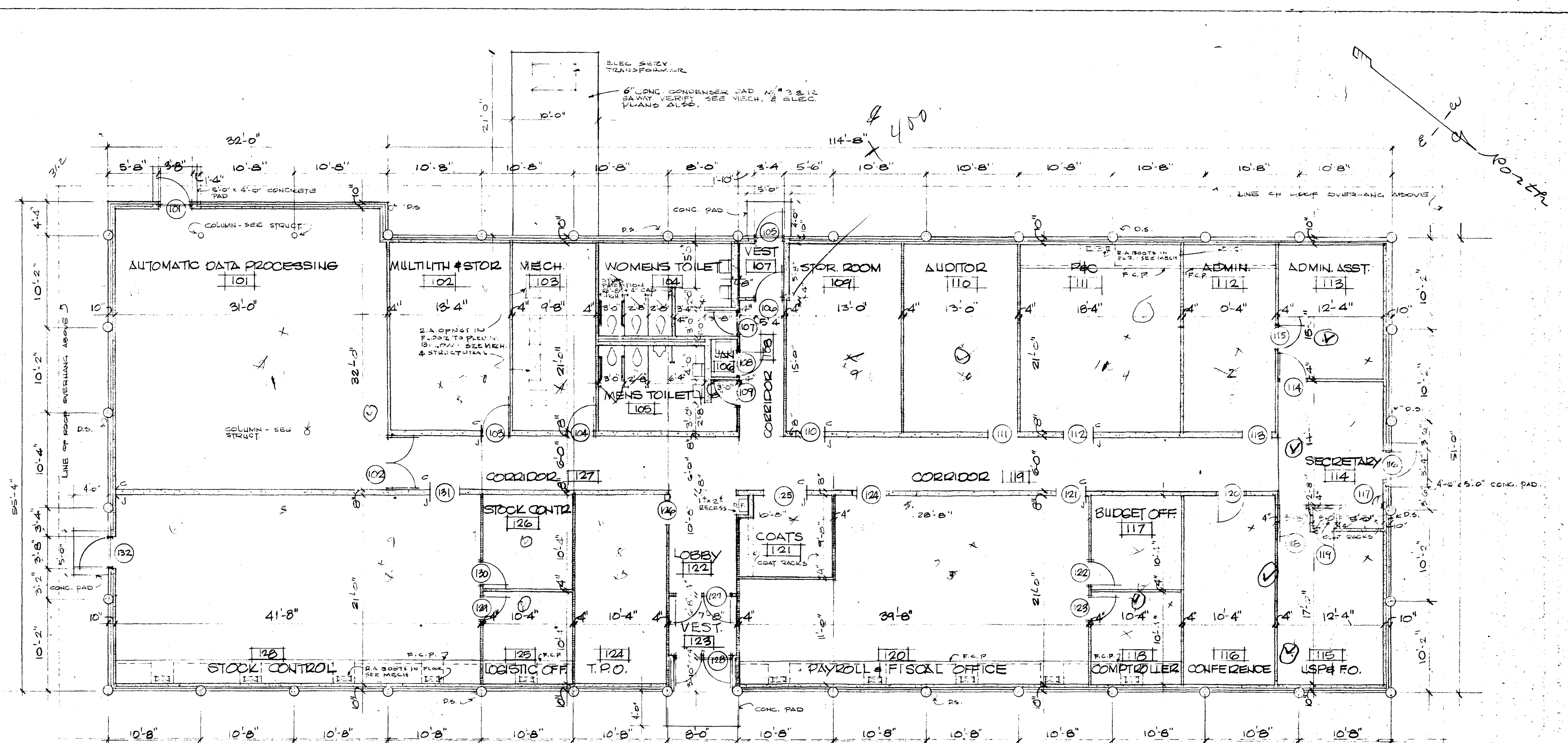
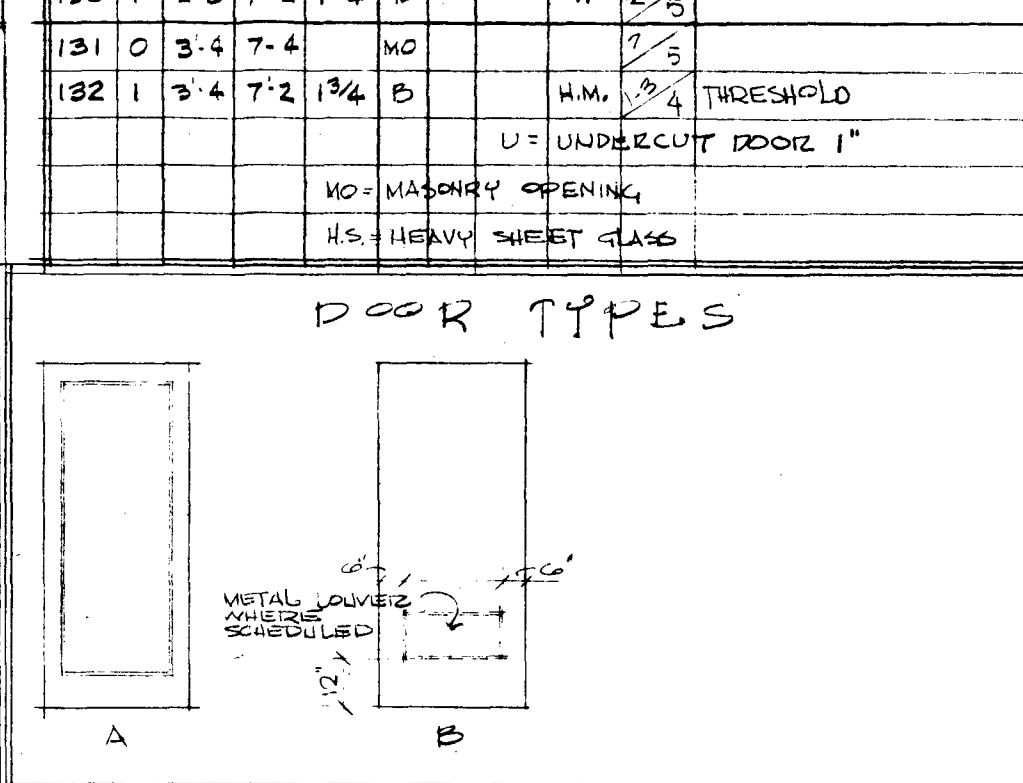
Photo 17: Sloped slab east of room 113

Exhibit A-2 – Existing Plans

ROOM FINISH SCHEDULE											
ROOM NAME & NUMBER	FLOOR	BASE	WALLS	CEILING	DOOR	REMARKS	ROOM NUMBER	SIZE	TYPE	REMARKS	
AUTO. DATA. PROC. 101						SEE REFLECTED ON PLAN	101	24' 7 1/2" x 19' 6"	D	H.M.	THRESHOLD
MULTIPLY # STO. 102							102	2' 0" x 7' 2"	B	W	
MECHANICAL 103							103	3' 0" x 7' 2"	B	H.M.	
WOMEN'S TOILET 104							104	3' 0" x 7' 2"	B	H.M.	* LABEL
MEN'S TOILET 105						"DITTO"	105	3' 0" x 7' 2"	B	H.M.	THRESHOLD
JANITOR 106						"DITTO"	106	1' 0" x 7' 2"	B	H.M.	
VESTIBULE 107							107	2' 0" x 7' 2"	B	U	W
CORRIDOR 108							108	2' 0" x 7' 2"	B	U	W
STORAGE ROOM 109							109	2' 0" x 7' 2"	B	U	W
AUDITOR 110							110	3' 4" x 7' 4"	NO		
P. E. C. 111						VINYL BASE & F.C.P.	111	3' 4" x 7' 4"	NO		
ADMINISTRATIVE 112						"DITTO"	112	3' 4" x 7' 4"	NO		
ADMIN. ASST. 113							113	3' 4" x 7' 4"	NO		
SECRETARY 114						SEE REFLECTED ON PLAN	114	3' 0" x 7' 2"	B	W	
U.S.P. & F.O. 115						"DITTO"	115	2' 0" x 7' 2"	B	W	
CONFERENCE 116							116	3' 0" x 7' 2"	B	H.M.	THRESHOLD
BUDGET OFFICE 117							117	4' 1" x 7' 0" x 17' 0"	B	W	THRESHOLD
COMPTROLLER 118						VINYL BASE & F.C.P.	118	3' 0" x 7' 2"	B	W	
CORRIDOR 119							119	2' 0" x 7' 2"	B	W	
PRY. OFFICE 120						VINYL BASE & F.C.P.	120	3' 0" x 7' 2"	B	W	
COATS 121							121	3' 4" x 7' 4"	NO		
LOBBY 122							122	2' 0" x 7' 2"	B	W	
VESTIBULE 123							123	2' 0" x 7' 2"	B	W	
T.P.O. 124							124	3' 4" x 7' 4"	NO		
LOGISTIC OFFICE 125						VINYL BASE & F.C.P.	125	3' 0" x 7' 4"	NO		
STOCK CONTR. 126							126	3' 4" x 7' 4"	NO		
CORRIDOR 127							127	2' 0" x 7' 2"	B	W	
STOCK CONTROL 128						VINYL BASE & F.C.P.	128	2' 0" x 7' 2"	B	W	THRESHOLD
							129	2' 0" x 7' 2"	B	W	
							130	2' 0" x 7' 2"	B	W	
							131	3' 4" x 7' 4"	NO		THRESHOLD
							132	1' 0" x 7' 2"	B	U	W

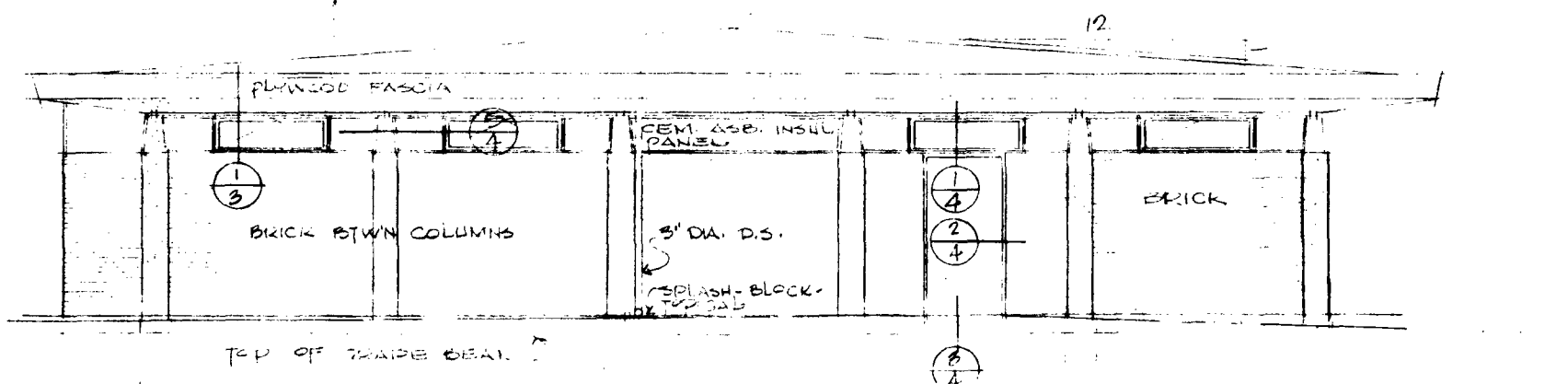
DOOR SCHEDULE									
ROOM NUMBER	SIZE	TYPE	LOUVER	GLASS	REMARKS				
101	24' 7 1/2" x 19' 6"	D			H.M.				
102	2' 0" x 7' 2"	B			W				
103	3' 0" x 7' 2"	B			H.M.				
104	3' 0" x 7' 2"	B			H.M.				
105	3' 0" x 7' 2"	B			H.M.				
106	1' 0" x 7' 2"	B			H.M.				
107	2' 0" x 7' 2"	B			U				
108	2' 0" x 7' 2"	B			U				
109	2' 0" x 7' 2"	B			U				
110	3' 4" x 7' 4"	NO							
111	3' 4" x 7' 4"	NO							
112	3' 4" x 7' 4"	NO							
113	3' 4" x 7' 4"	NO							
114	3' 0" x 7' 2"	B			W				
115	2' 0" x 7' 2"	B			W				
116	3' 0" x 7' 2"	B			H.M.				
117	4' 1" x 7' 0" x 17' 0"	B			W				
118	3' 0" x 7' 2"	B			W				
119	2' 0" x 7' 2"	B			W				
120	3' 0" x 7' 2"	B			W				
121	3' 4" x 7' 4"	NO							
122	2' 0" x 7' 2"	B			W				
123	2' 0" x 7' 2"	B			W				
124	3' 4" x 7' 4"	NO							
125	3' 0" x 7' 4"	NO							
126	3' 4" x 7' 4"	NO							
127	2' 0" x 7' 2"	B			W				
128	2' 0" x 7' 2"	B			W				
129	2' 0" x 7' 2"	B			W				
130	2' 0" x 7' 2"	B			W				
131	3' 4" x 7' 4"	NO							
132	1' 0" x 7' 2"	B			U				

MATERIALS LEGEND	
	CONCRETE BLOCK
	BRICK
	GLAZED STRUCTURAL UNIT (C.O.D.S.)
	CONCRETE
	STONE
	WOOD (FINISH)
	STEEL
	INSULATION
	PLYWOOD
	GYPSUM BOARD
	METAL MESH

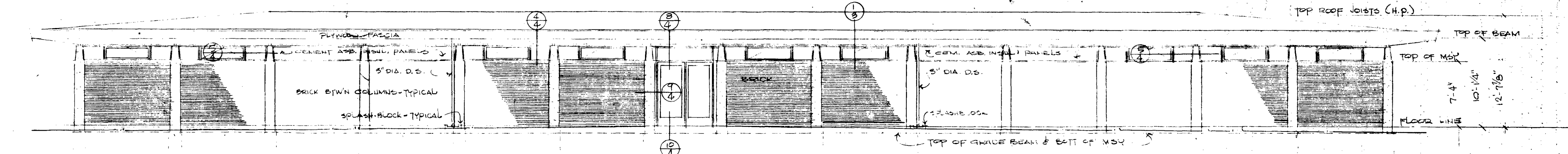


FLOOR PLAN
SCALE: 1/8" = 1'-0"

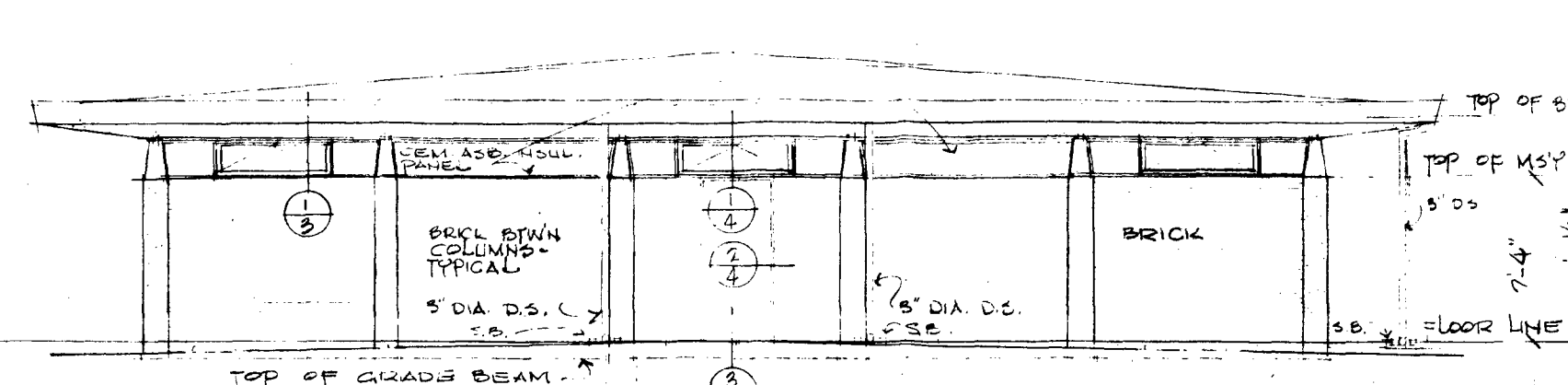
DETAILS FILE CABINET PLATFORM (F.C.P.)
SCALE: 1" = 1'-0"



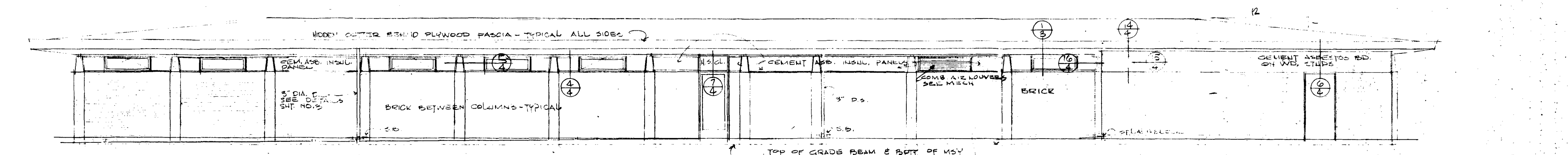
SOUTH-EAST ELEVATION
SCALE: 1/8" = 1'-0"



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



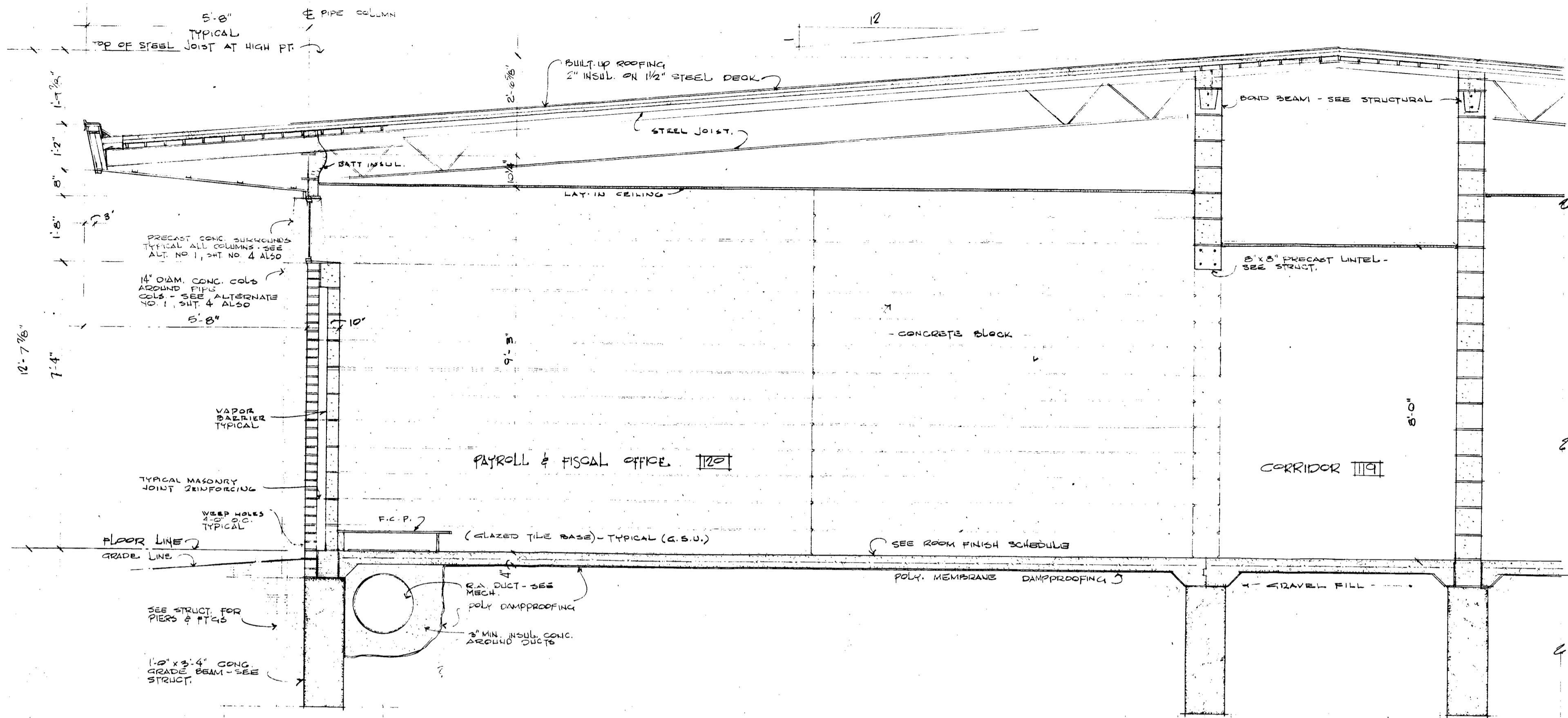
NORTH-WEST ELEVATION
SCALE: 1/8" = 1'-0"



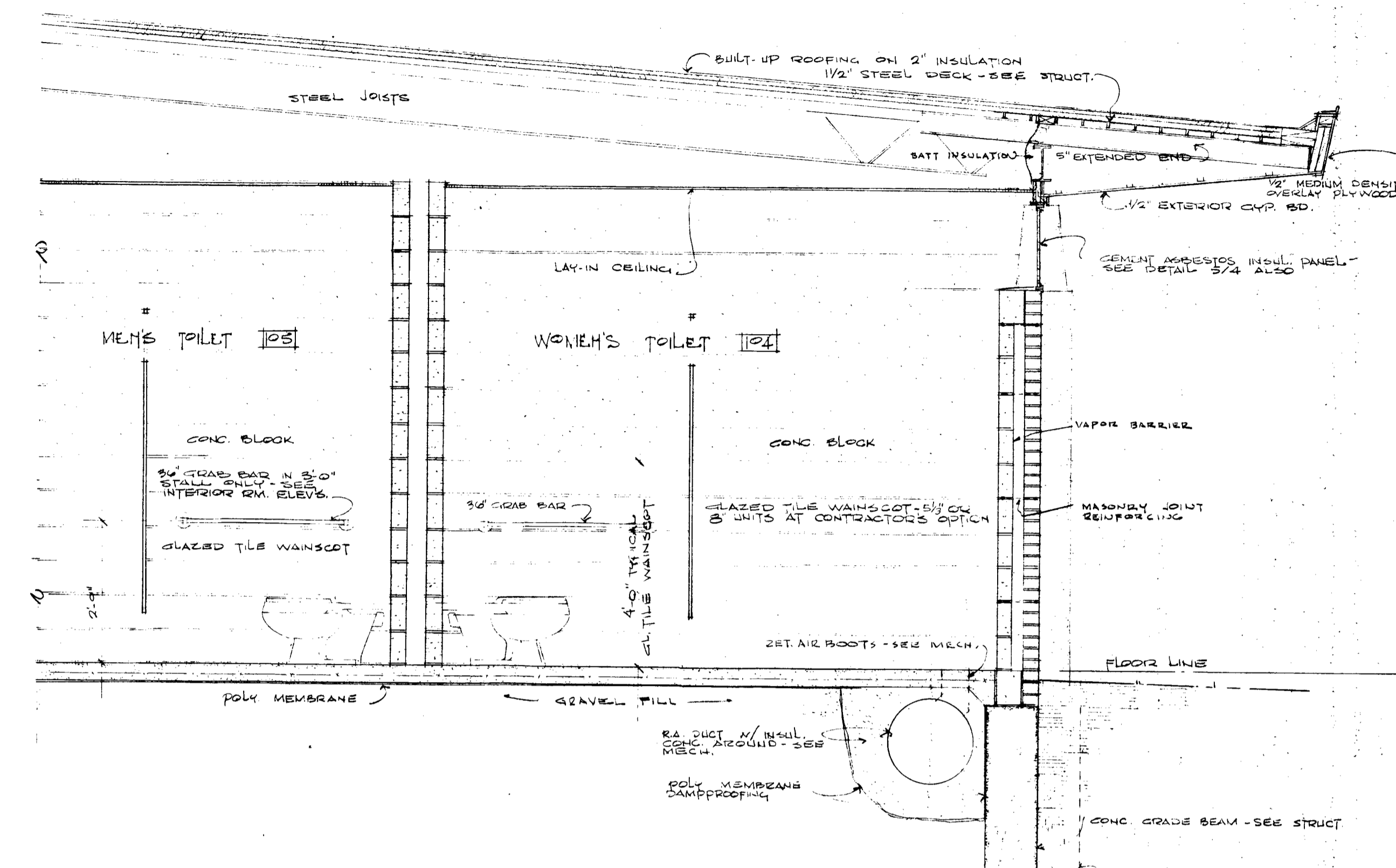
SOUTH-WEST ELEVATION
SCALE: 1/8" = 1'-0"

OFFICE BUILDING
UNITED STATES PROPERTY & FISCAL OFFICER
IOWA NATIONAL GUARD
CAMP DODGE, IOWA
MAJOR GENERAL JOSEPH S. WYATT, ADJUTANT GENERAL OF IOWA
CAMP DODGE, IOWA
WETHERELL-HARRISON-WAGNER-McKLVEN
architects
DES MOINES, IOWA

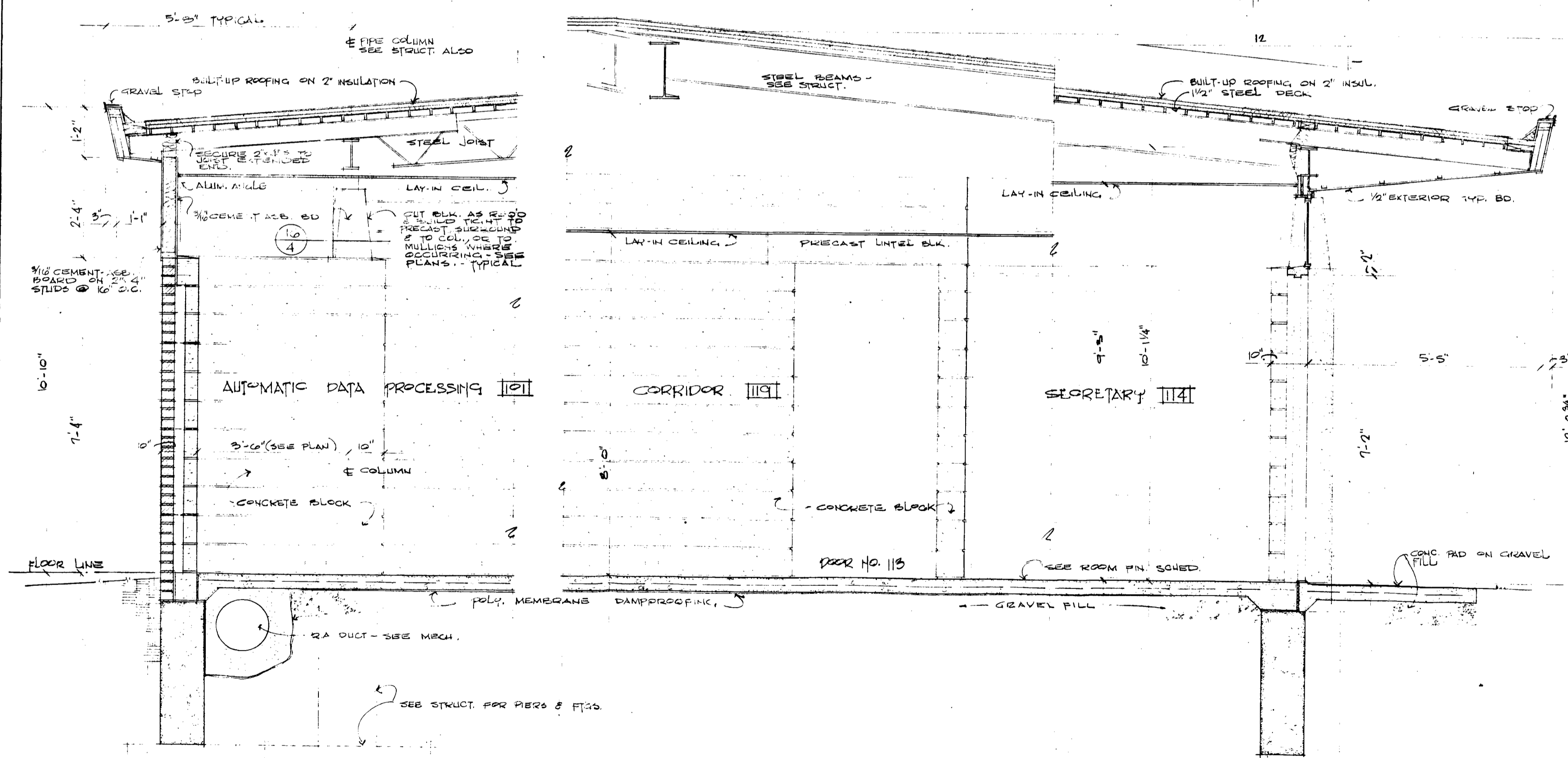
SHEET 2
OF 15 SHEETS
FILE 11
DATE 6/5/49



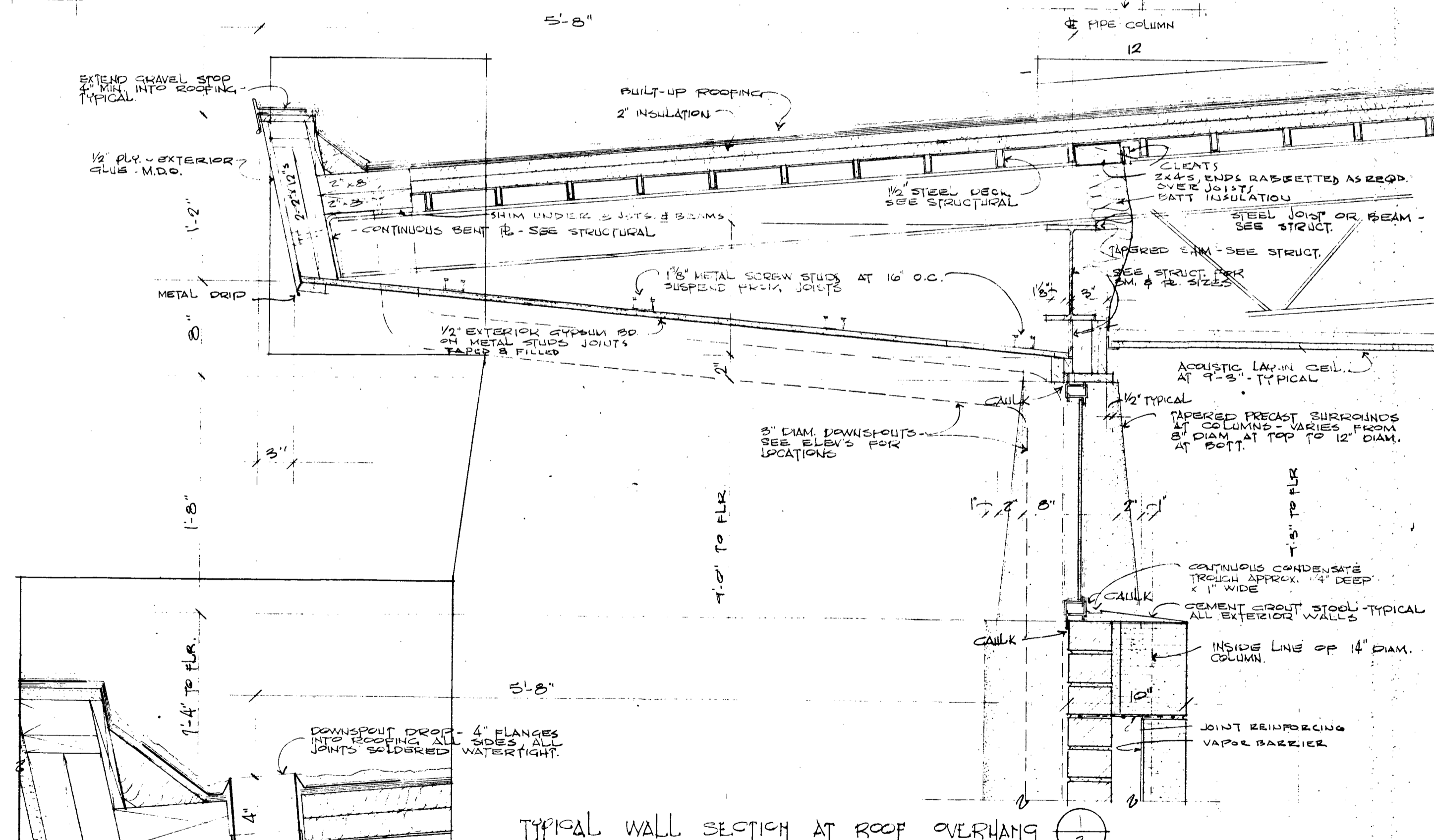
PART BLDG SECTION AT PAYROLL & FISCAL OFFICE NORTHEAST WALL



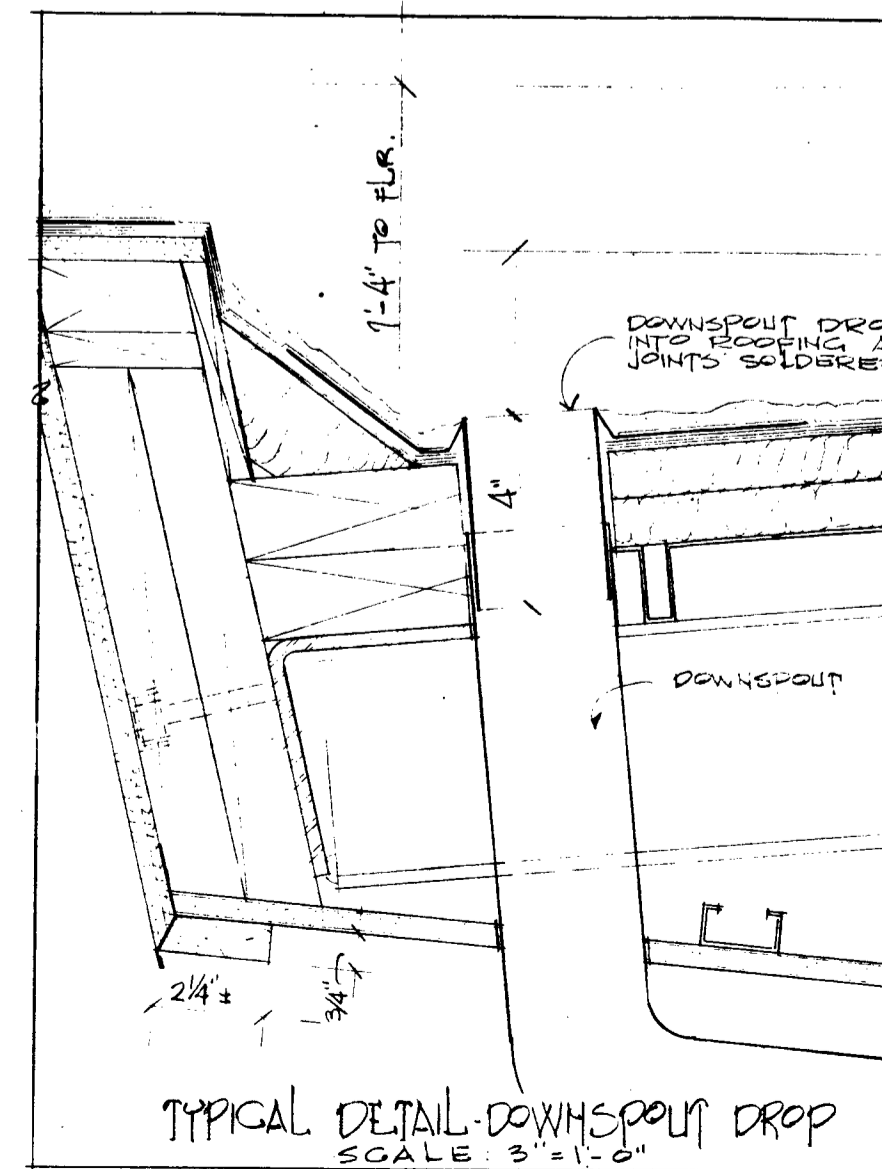
WOMEN'S TOILET SOUTHWEST WALL SECTION



TYPICAL WALL SECTIONS
SCALE 1/2" = 1'-0"

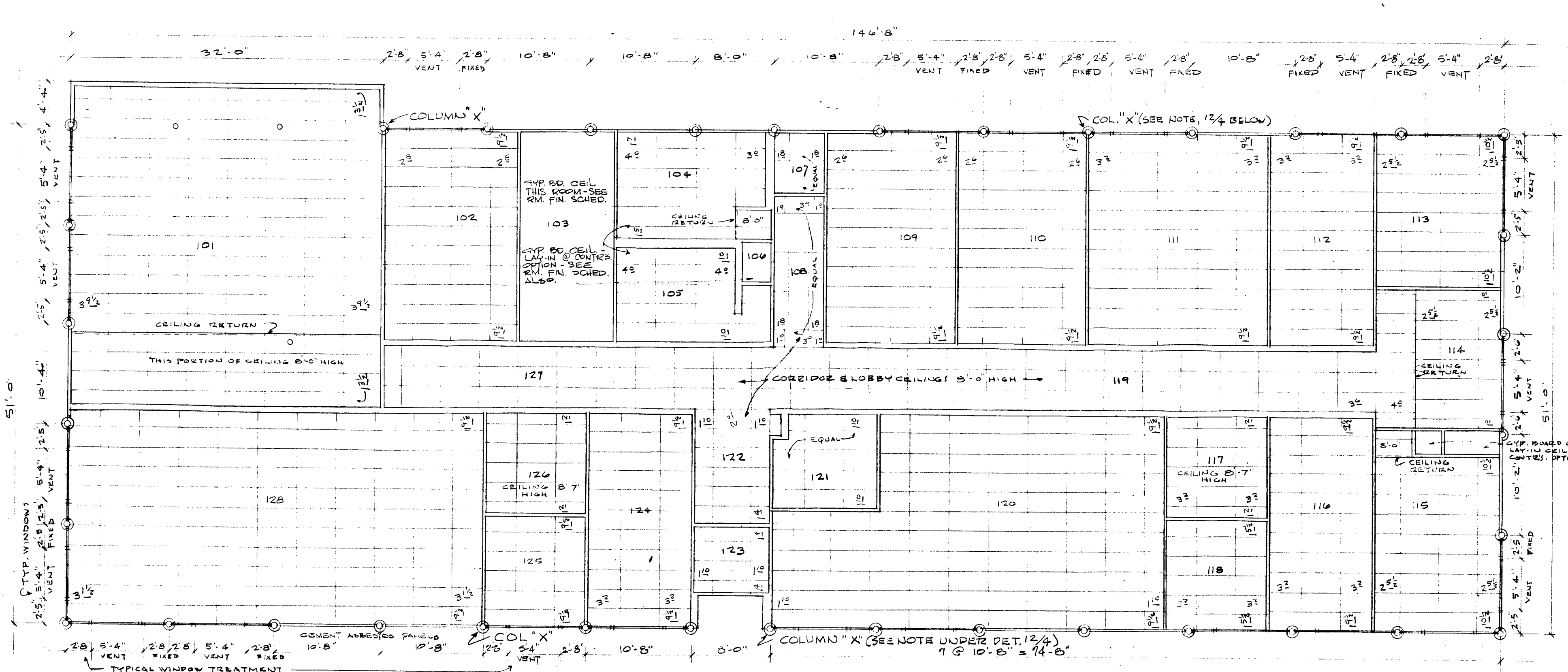


TYPICAL WALL SECTION AT ROOF OVERHANG
SCALE 1/2" = 1'-0"

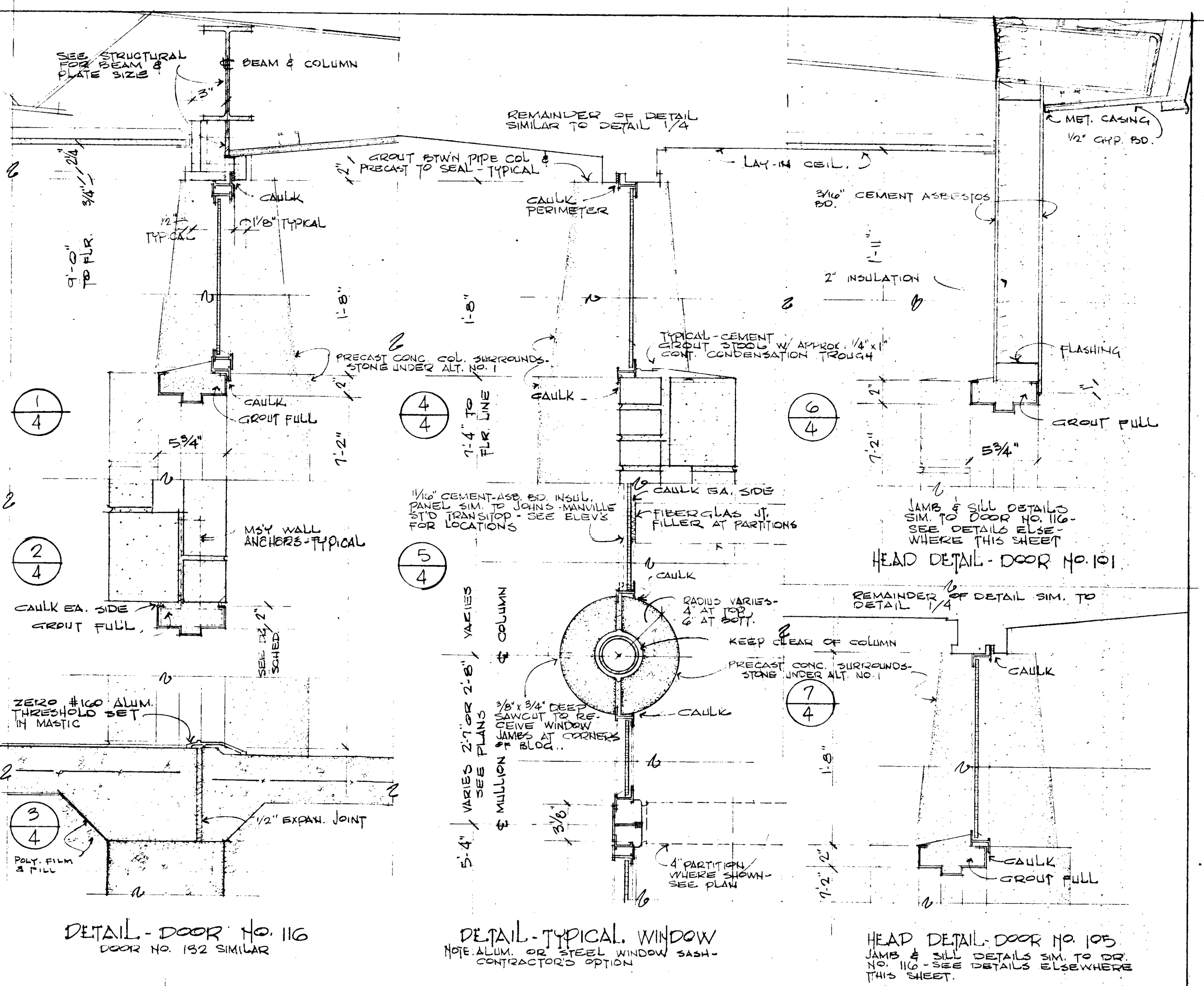


TYPICAL DETAIL-DOWNSPOUT DROP
SCALE 3/4" = 1'-0"

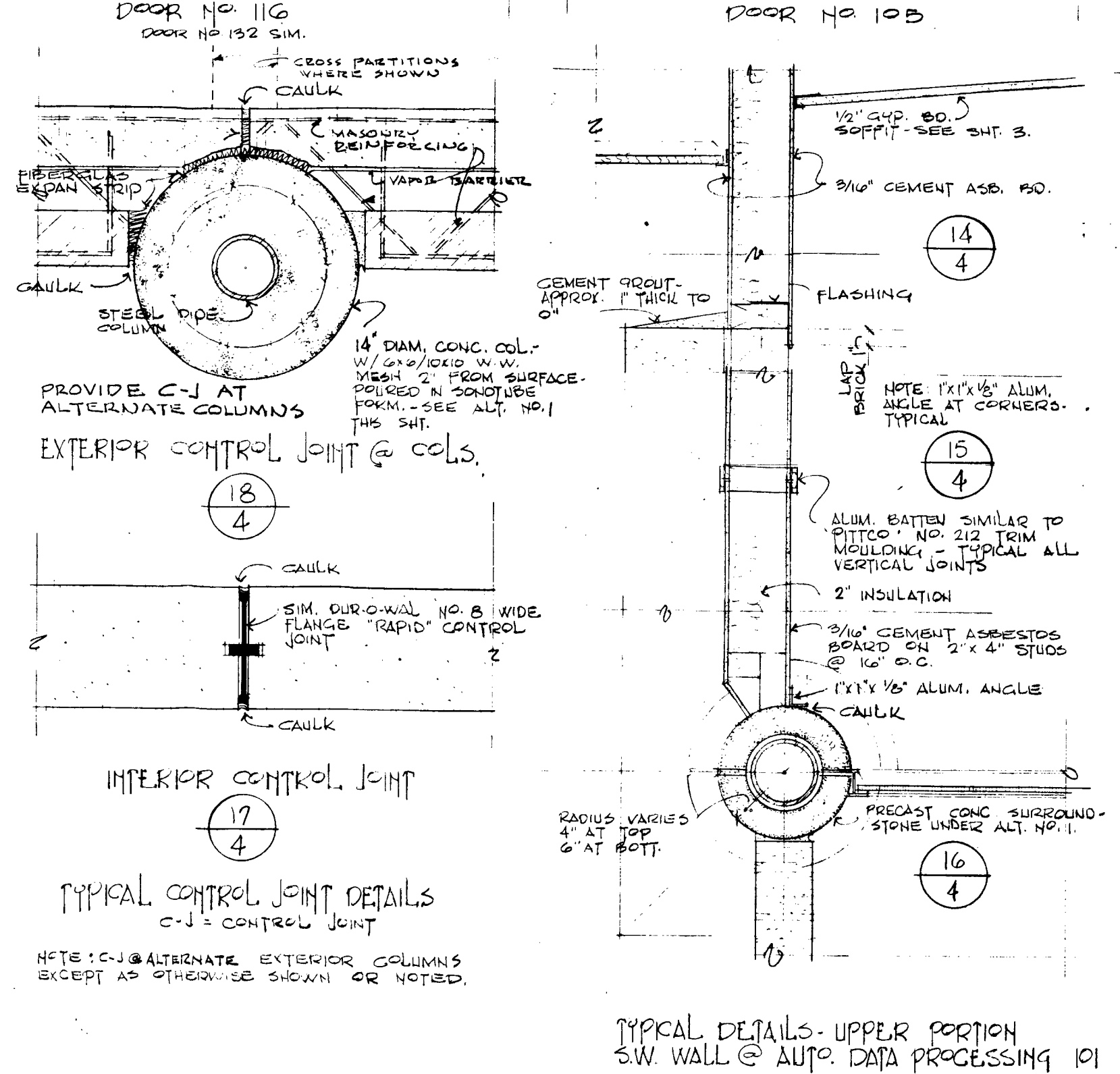
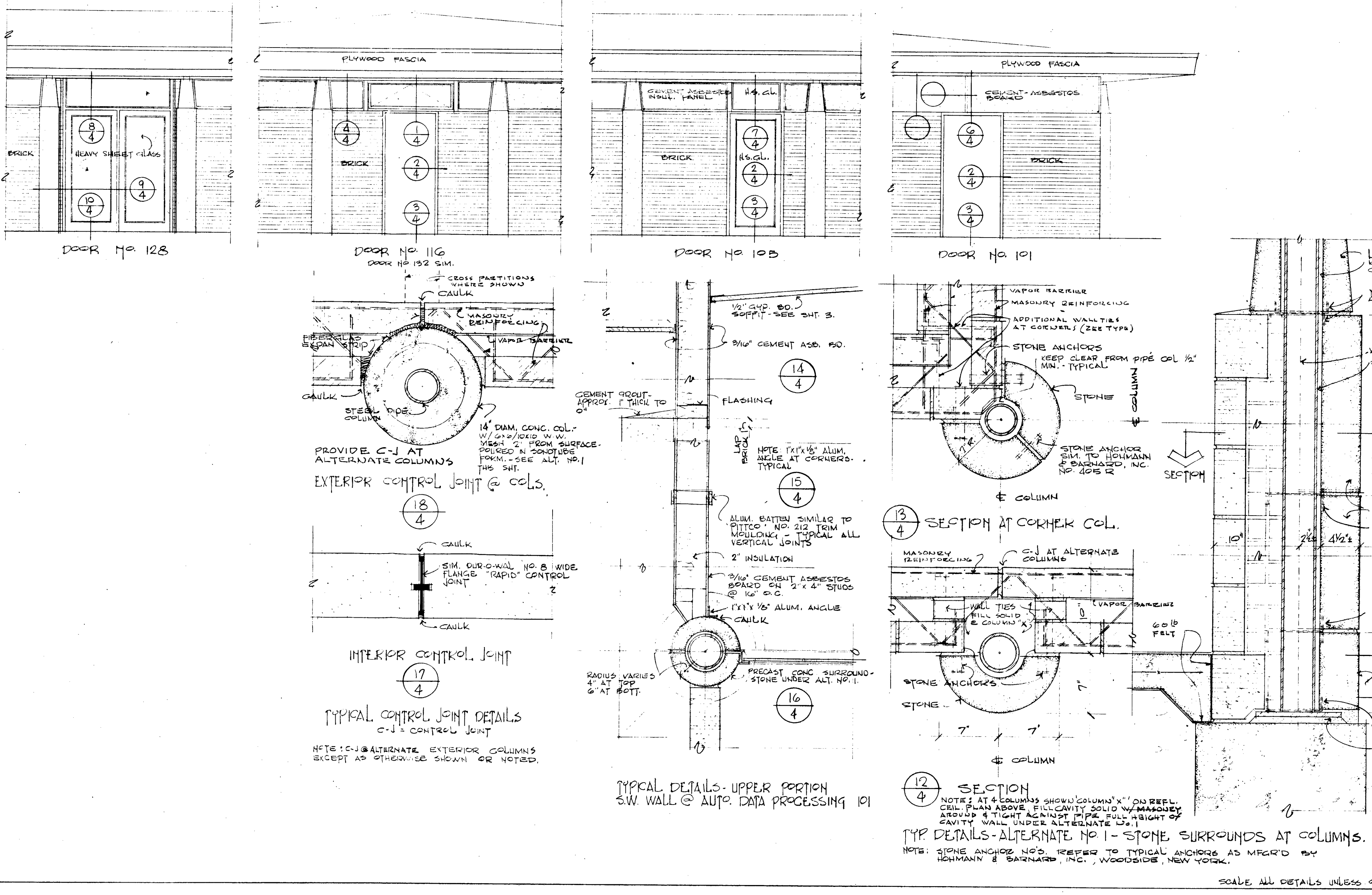
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	UNITED STATES PROPERTY & FISCAL OFFICER	SHEET
	IOWA NATIONAL GUARD	3
	CAMP DODGE, IOWA	OF 5 SHEETS
	MAJOR GENERAL JOSEPH H. MAY ADJUTANT GENERAL OF IOWA	FILE 1.1
CAMP DODGE, IOWA	DES MOINES, IOWA	DATE 6/3/69
WETHERELL - HARRISON - WAGNER - MCKLVEEN architects 500 HUBBELL BUILDING DES MOINES, IOWA		



WINDOW & REFLECTED CEILING PLAN
SCALE: 1/8" = 1'-0"
NOTE: CEILINGS 9'-3" HIGH EXCEPT AS OTHERWISE SHOWN.

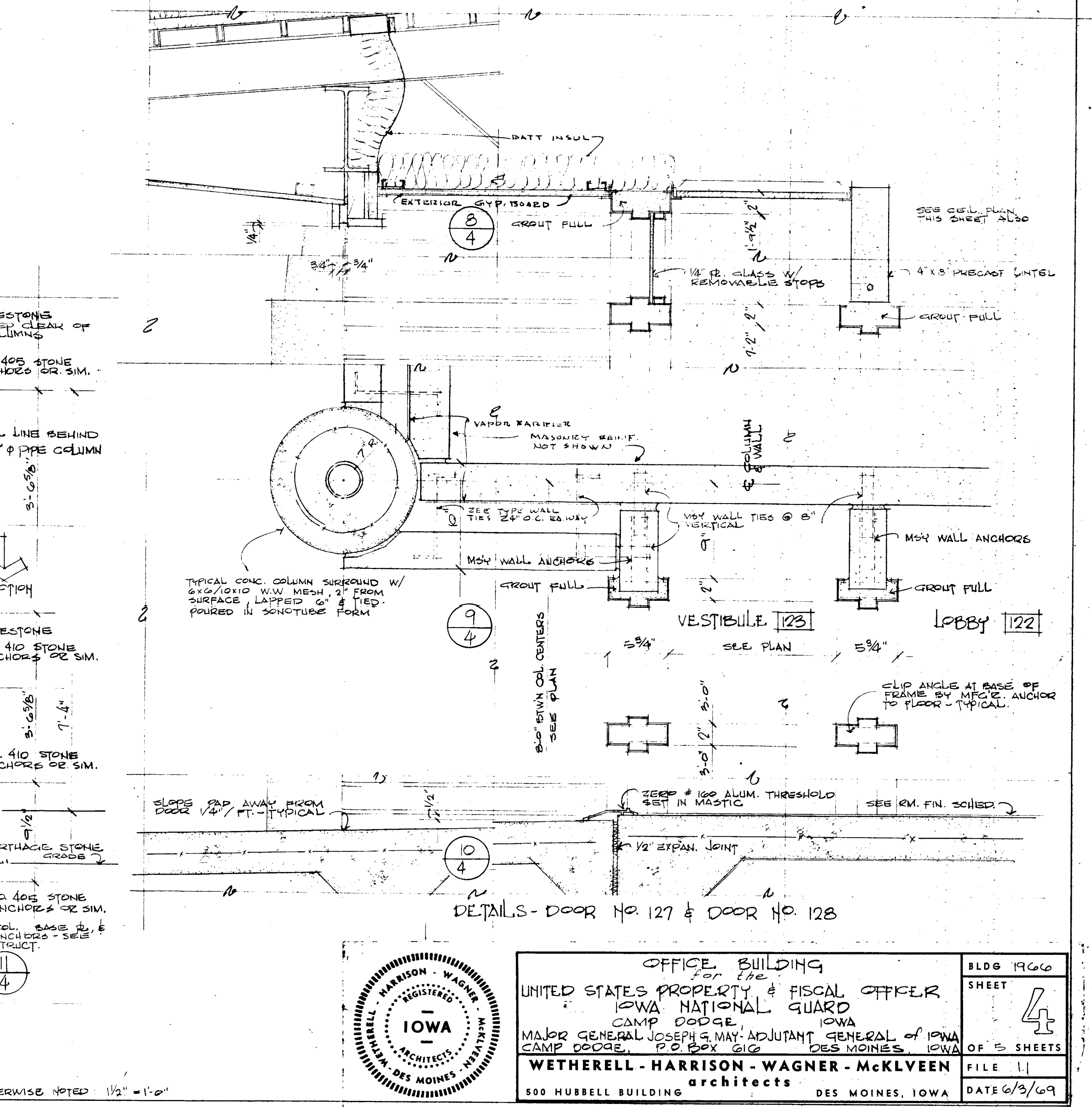


DETAIL - DOOR NO. 116
DETAIL - TYPICAL WINDOW
HEAD DETAIL - DOOR NO. 101



EXTERIOR CONTROL JOINT @ COLS.
INTERIOR CONTROL JOINT
TYPICAL CONTROL JOINT DETAILS
NOTE: ALTERNATE EXTERIOR COLUMNS EXCEPT AS SHOWN IN SECTION OR VIEWED

TYPICAL DETAILS - UPPER PORTION
SW WALL @ AUTO DATA PROCESSING R1



DETAILS - DOOR NO. 127 & DOOR NO. 128

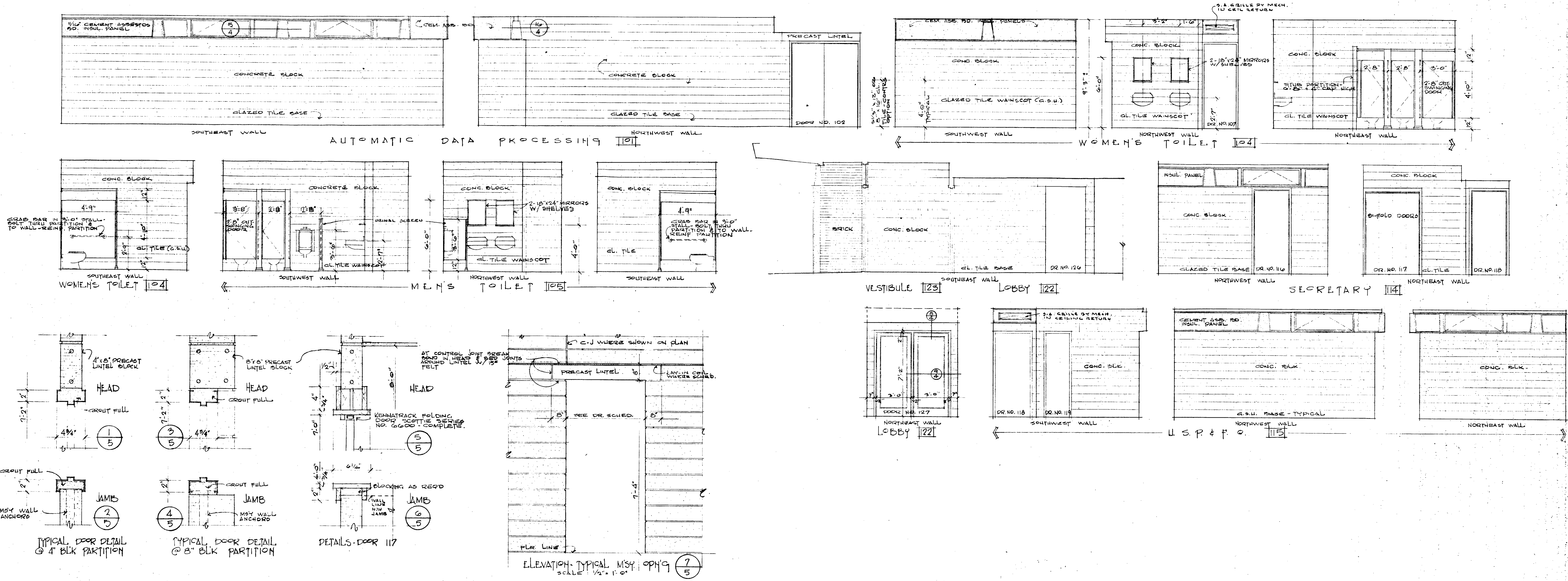
OFFICE BUILDING
UNITED STATES PROPERTY & FISCAL OFFICE
IOWA NATIONAL GUARD
CAMP OGDGE
IOWA
MAJOR GENERAL OSCAR W. MOUNTAIN
GENERAL OF IOWA
CAMP OGDGE
DES MOINES, IOWA

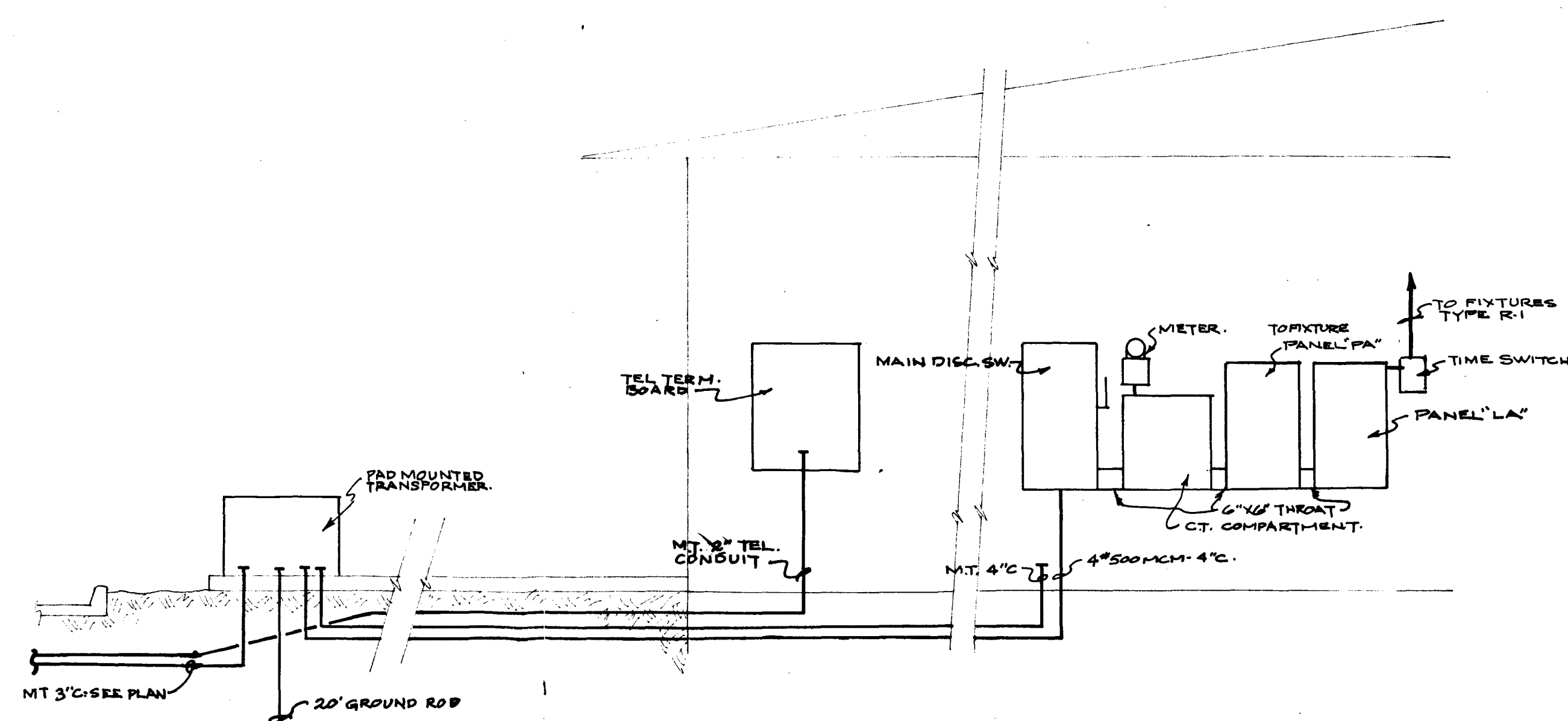
WETHERELL - HARRISON - WAGNER - MCKLIVEN
DES MOINES, IOWA

300 HUBBELL BUILDING
DES MOINES, IOWA

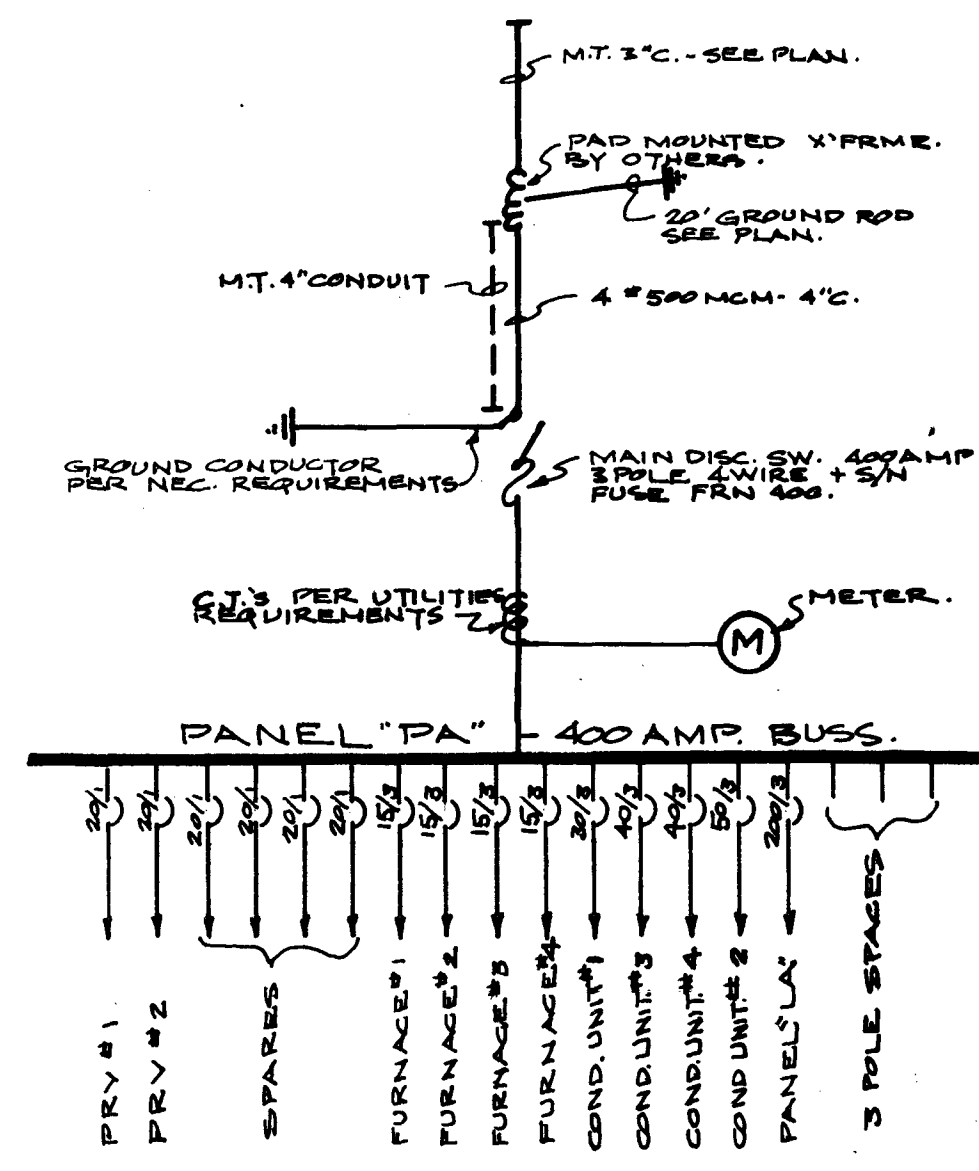
DATE 6/9/69

1000
SHEET
OF 10 SHEETS
FILE 11





FEEDER DISTRIBUTION DIAGRAM
NO SCALE



SERVICE ENTRANCE DIAGRAM
NO SCALE

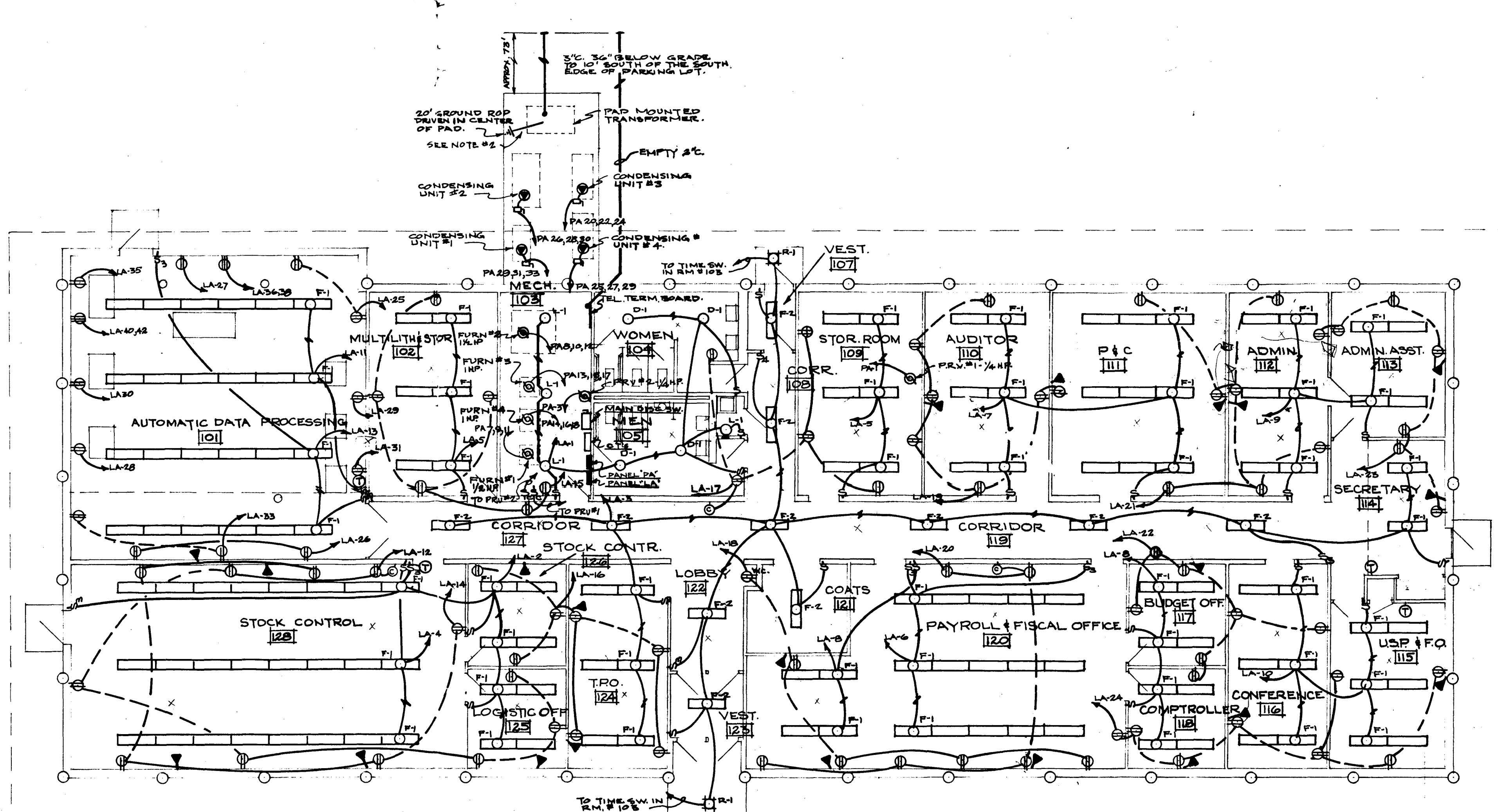
PANEL "PA"		400 AMP BUS		120/208V, 3Ø, 4W	
1	15 AMP 3 POLE	7,13,15,17	SPACES	1	COND. UNIT #1
2	30 AMP 3 POLE	19,21,23	COND. UNIT #1	2	COND. UNIT #2 & 4
3	40 AMP 3 POLE	25,27,29,31,33	COND. UNIT #1	1	COND. UNIT #2
4	50 AMP 3 POLE	35,37,39,41	PANEL "LA"	1	COND. UNIT #2
5	20 AMP 3 POLE	33,34,35-42	SPACES		

PANEL "LA"		225 AMP BUS		120/208V, 3Ø, 4W	
1	30 AMP 3 POLE	1-31,33,35	LIGHTING, RECEPT. & DATA PANELS, EQUIP.	1	SPACES
2	30 AMP 3 POLE	33,34,35,39,41	SPACES	2	220V. RECEPTACLES

- ELECTRICAL SYMBOLS
- CEILING OUTLET
 - RECESSED FIXTURE
 - WALL BRACKET - HEIGHT AS INDICATED
 - FLUORESCENT FIXTURE
 - DUPLEX CONVENIENCE OUTLET +14" OR AS NOTED
 - DUPLEX CONVENIENCE OUTLET 8" ABOVE COUNTER TOP OR AS NOTED
 - 220V. 2ØA. RECEPTACLE OUTLET +14" OR AS NOTED
 - EQUIPMENT CONNECTION
 - MOTOR OUTLET
 - CLOCK HANGER OUTLET + 7'-6" OR AS NOTED
 - JUNCTION BOX
 - TELEPHONE OUTLET +14" OR AS NOTED
 - PANEL - SURFACE
 - PANEL - FLUSH
 - SWITCH LEG TO SINGLE POLE SWITCH +48" OR AS NOTED
 - SWITCH LEG TO THREE WAY SWITCH +48" OR AS NOTED
 - SWITCH LEG TO FOUR WAY SWITCH +48" OR AS NOTED
 - SWITCH LEG TO SECONDARY CIRCUIT BREAKER +48" OR AS NOTED
 - SWITCH LEG TO SWITCH WITH PILOT +48" OR AS NOTED
 - CONCEALED CONDUIT WITH WIRING TO SWITCH
 - EXPOSED CONDUIT OR METAL RACEWAY AS NOTED
 - CONDUIT CONCEALED IN CEILING OR WALL CONSTRUCTION
 - CONDUIT CONCEALED IN FLOOR CONSTRUCTION
 - +48" MOUNTED HEIGHT - CENTER LINE TO FINISHED FLOOR
 - WC- WATER COOLER
 - PRM- POWER ROOF VENTILATOR

NOTES

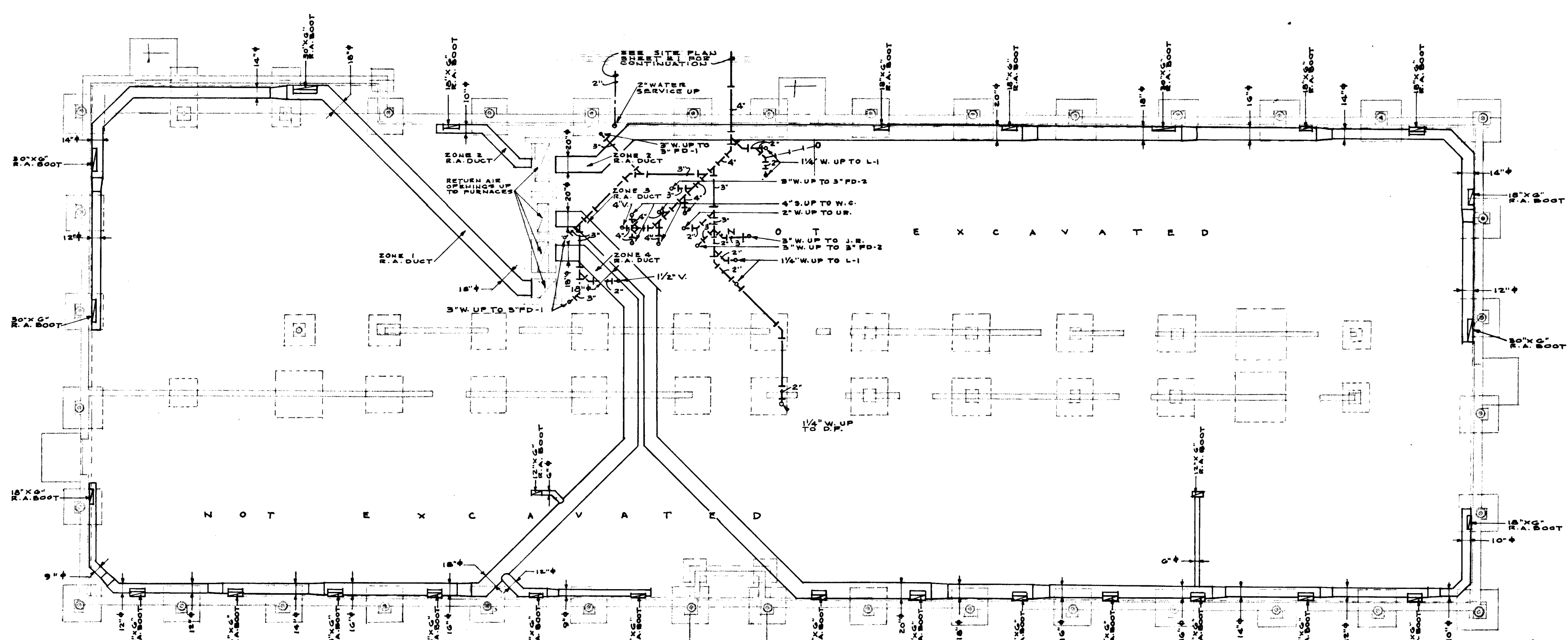
1. ALL RECEPTACLE - MT. 3/4" STUBBED INTO CEILING FROM ABOVE REMAINING IN PLACE.
2. ALL THE OUTLET OF THE 220V. RECEPTACLES SHALL BE MOUNTED INTO THE GROUND OR AS NOTED. DATA PANELS SHALL BE MOUNTED INTO THE GROUND OR AS NOTED. DATA PANELS SHALL BE MOUNTED INTO THE GROUND OR AS NOTED.



FLOOR PLAN
SCALE 1/8" = 1'-0"

OFFICE BUILDING		Sheet 1964
UNITED STATES PROPERTY & FISCAL OFFICER		SHEET
IOWA NATIONAL GUARD		E1
CAMP DODGE, IOWA		OF 3 SHEETS
MAJOR GENERAL JOSEPH W. ADJUTANT GENERAL IOWA		FILE NO.
CAMP DODGE P.O. BOX 218 - DES MOINES, IOWA		DATE 6/2/60
WETHERELL - HARRISON - WAGNER - MCKLVEEN		
architects		
FOR MURRELL BUILDING		
FRANK PULLEY ASSOCIATES INC.		
DES MOINES, IOWA		

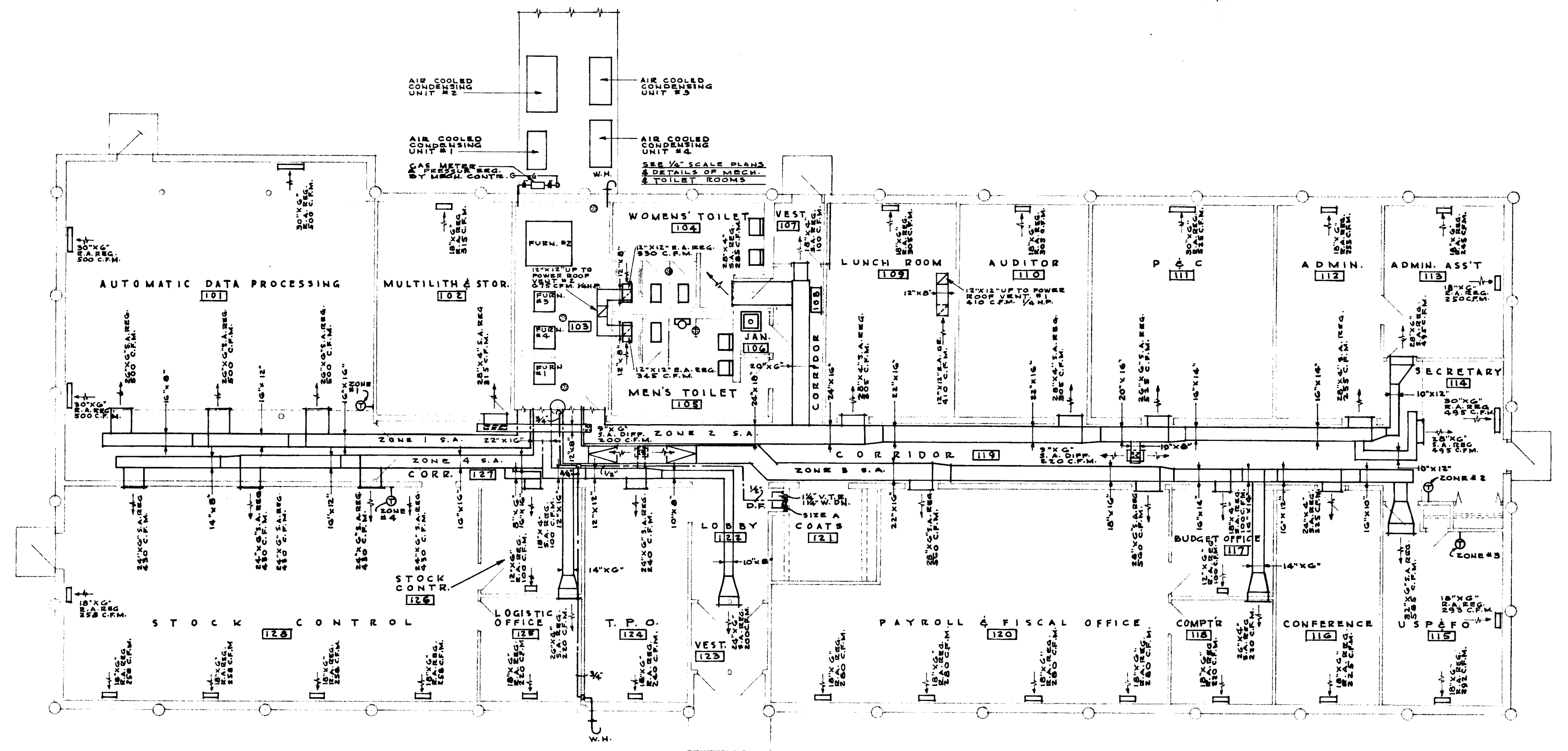
Date: Sept. 17, 1960 2528



UNDERFLOOR PLAN - PLUMBING & RETURN DUCTS
SCALE 1/8" = 1'-0"

NOTE: ALL UNDERFLOOR RETURN DUCTS SHALL BE INSTALLED IN THE EXCAVATED PORTION OF THE BUILDING. ALL OTHER RETURN DUCTS SHALL BE INSTALLED IN THE NOT EXCAVATED PORTION OF THE BUILDING.

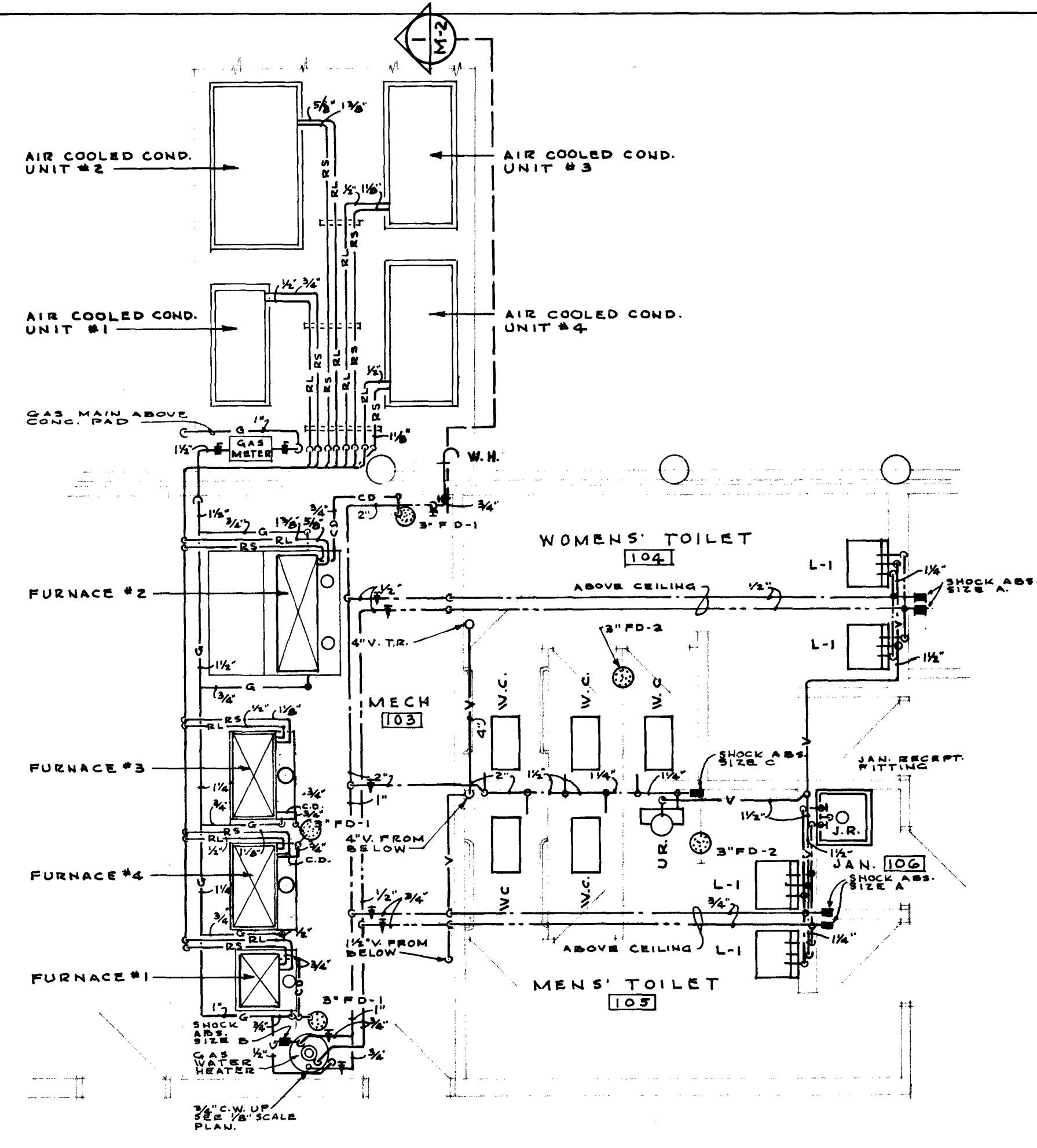
MECHANICAL SYMBOLS	
SYMBOL	DESCRIPTION
—	COLD WATER C.W.
—	HOT WATER H.W.
—	SOIL OR WASTE BELOW GRADE OR FLOOR S.W. WASTE
—	PLUMBING VENT V.V. VENT V.T.R. VENT THRU ROOF
—	CONDENSATE DRAIN
—	REFRIGERANT SUCTION
—	REFRIGERANT LIQUID
—	GAS
—	SHOCK ABSORBER
—	UNION
—	GATE VALVE
—	COCK
—	THERMOSTAT (+4'-0")
—	FLOOR DRAIN - NUMBER INDICATES TYPE - SEE SPECS.
—	WALL HYDRANT
—	INCLINED DROP IN DUCT IN DIRECTION OF >
—	DETAIL INDICATION NO. ABOVE - DETAIL NO. BELOW - SHEET NO.
—	NOTE REFERENCE NUMBER



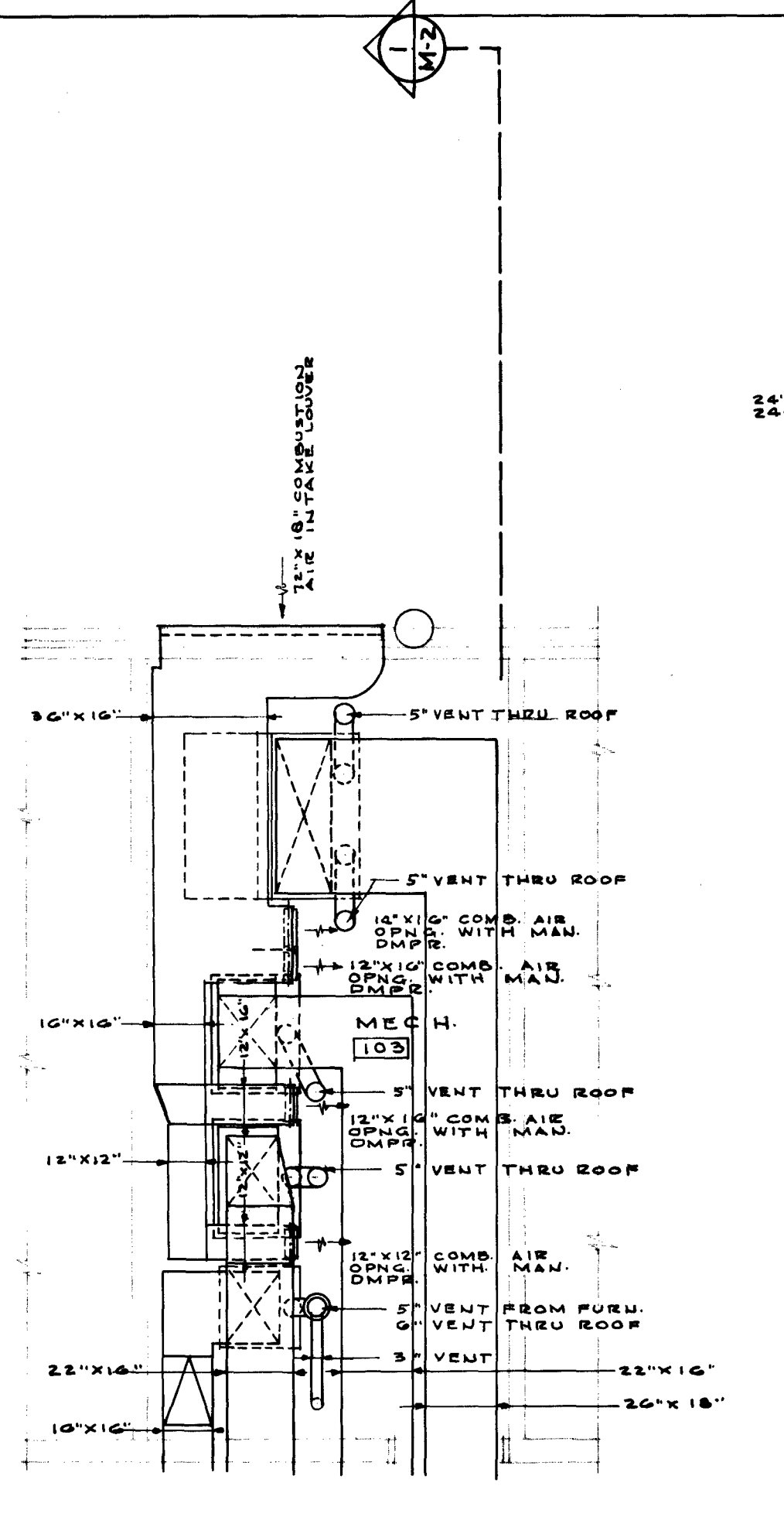
FLOOR PLAN
SCALE 1/8" = 1'-0"

I hereby certify that this plan, specification or report was prepared by me or under my direct personal supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Iowa.
Frank L. Falty, P.E.
Date: April 17, 1969 Reg. No. 2318

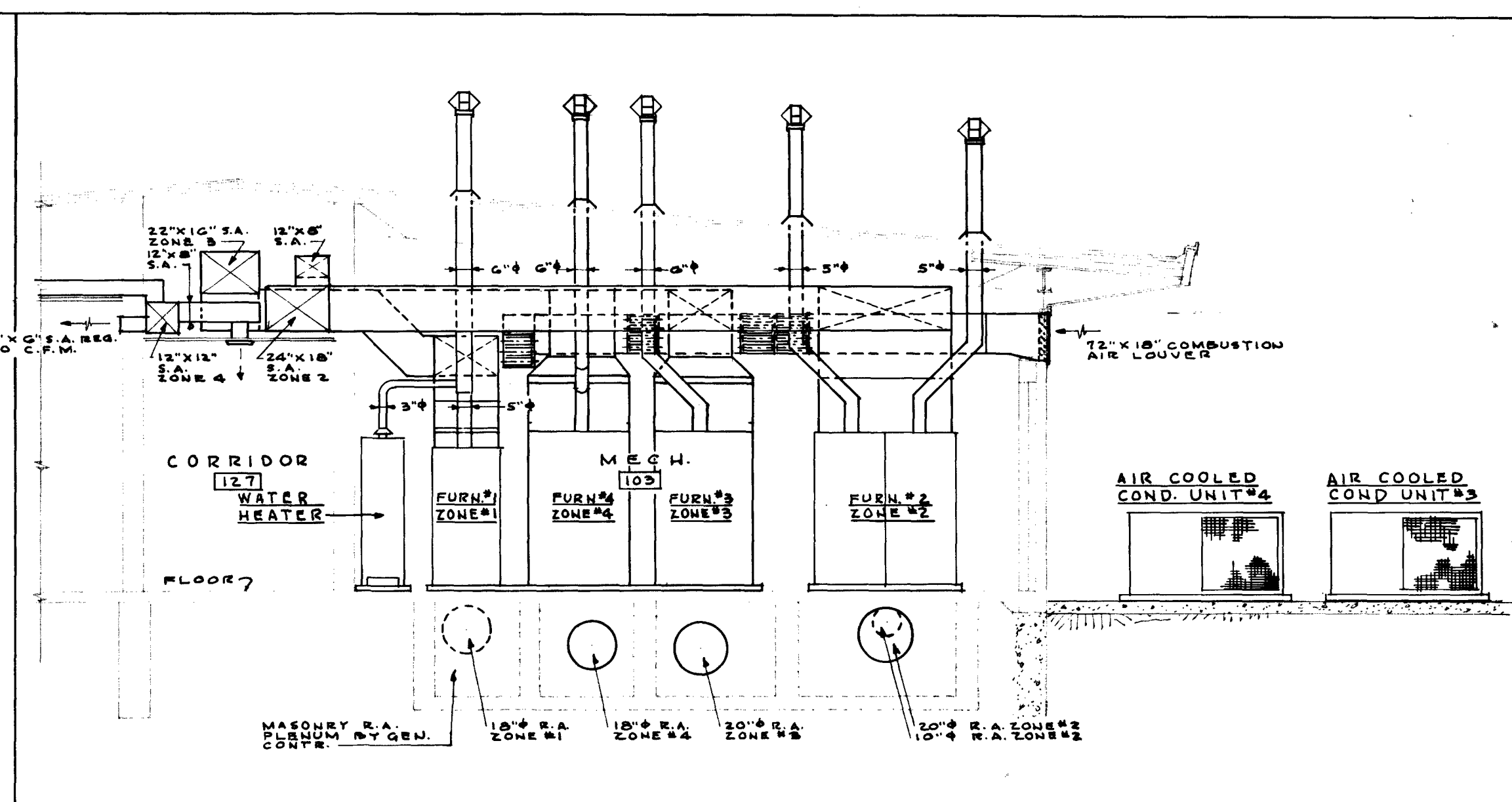
MECHANICAL - FLOOR & UNDERFLOOR PLANS		BLDG 1000
OFFICE BUILDING		SHEET
UNITED STATES PROPERTY & FISCAL OFFICER		M-1
IOWA NATIONAL GUARD		OF 2 SHEETS
CAMP DODGE, IOWA		FILE 1-1
MAJOR GENERAL JOSEPH W. ADJUTANT GENERAL 4/ IOWA		DATE 4/17/69
CAMP DODGE, P.O. BOX 616 DES MOINES, IOWA		
WETHERELL - HARRISON - WAGNER - MCKLVEEN ARCHITECTS DES MOINES, IOWA		
500 HUBBELL BUILDING		
FRANK P. FALTY ASSOCIATES, INC.		



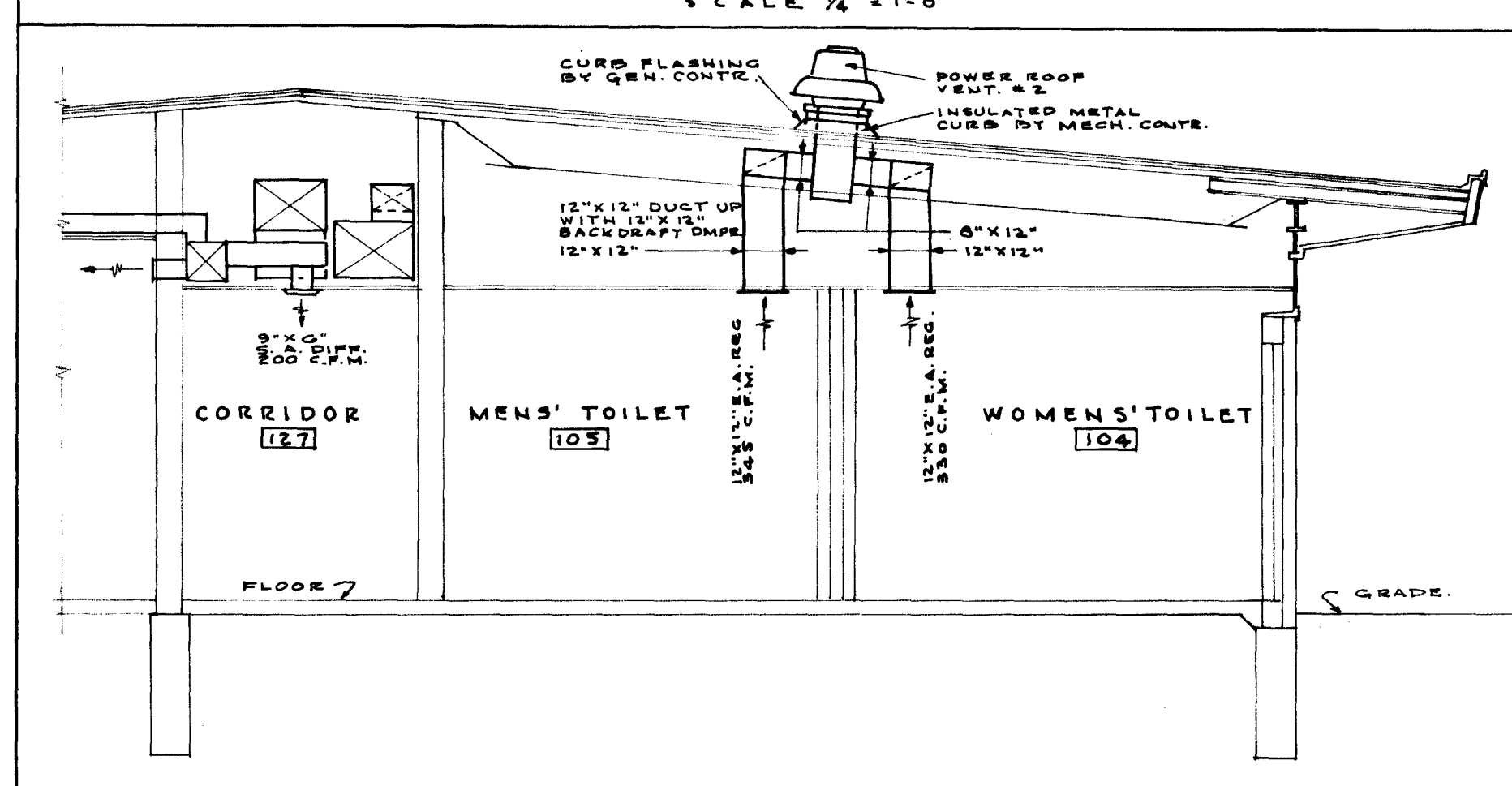
PART PLAN - ROOMS 103 THRU 106
SCALE 1/4" = 1'-0"



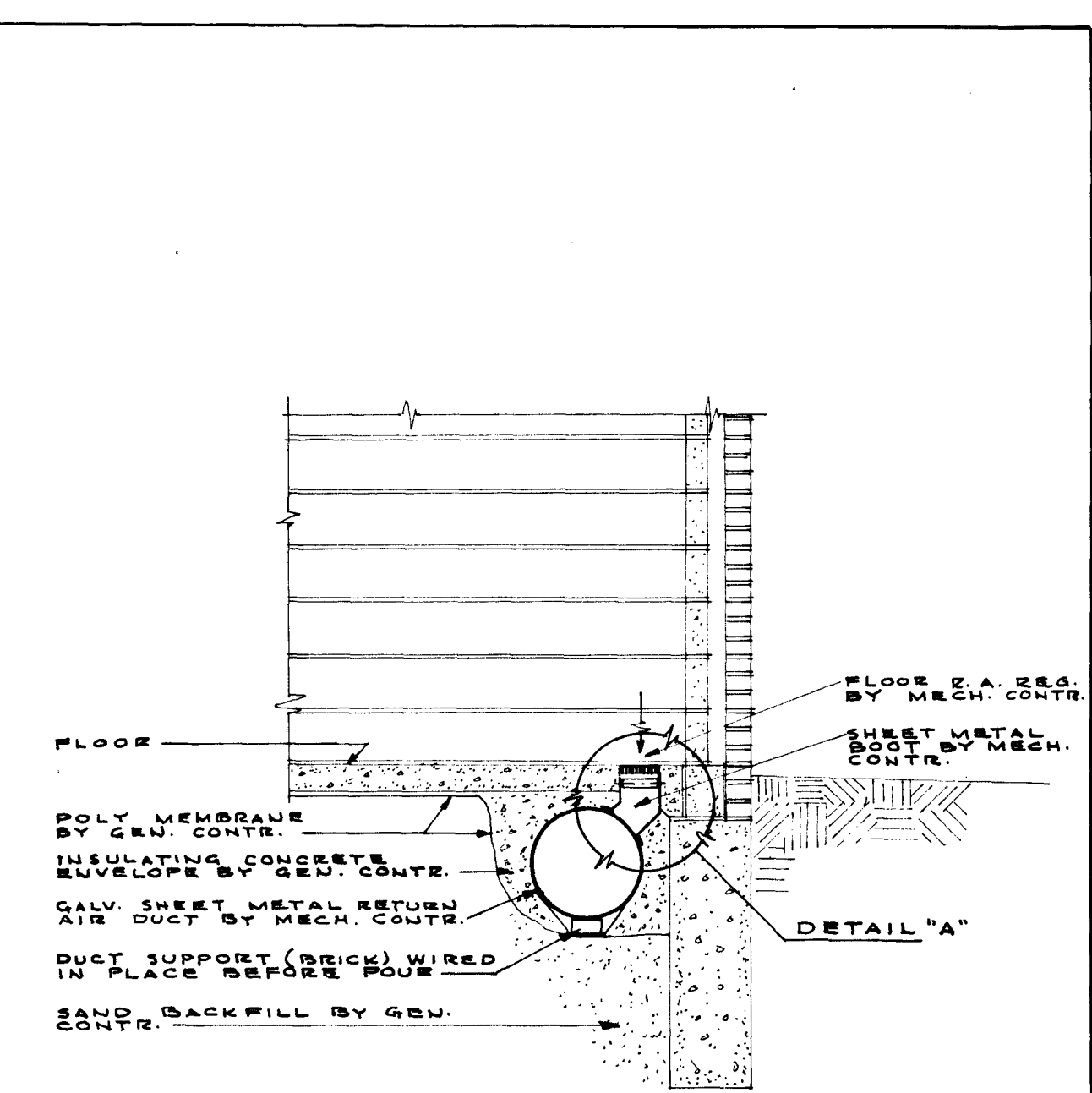
UPPER PART PLAN ROOM 103
SCALE 1/4" = 1'-0"



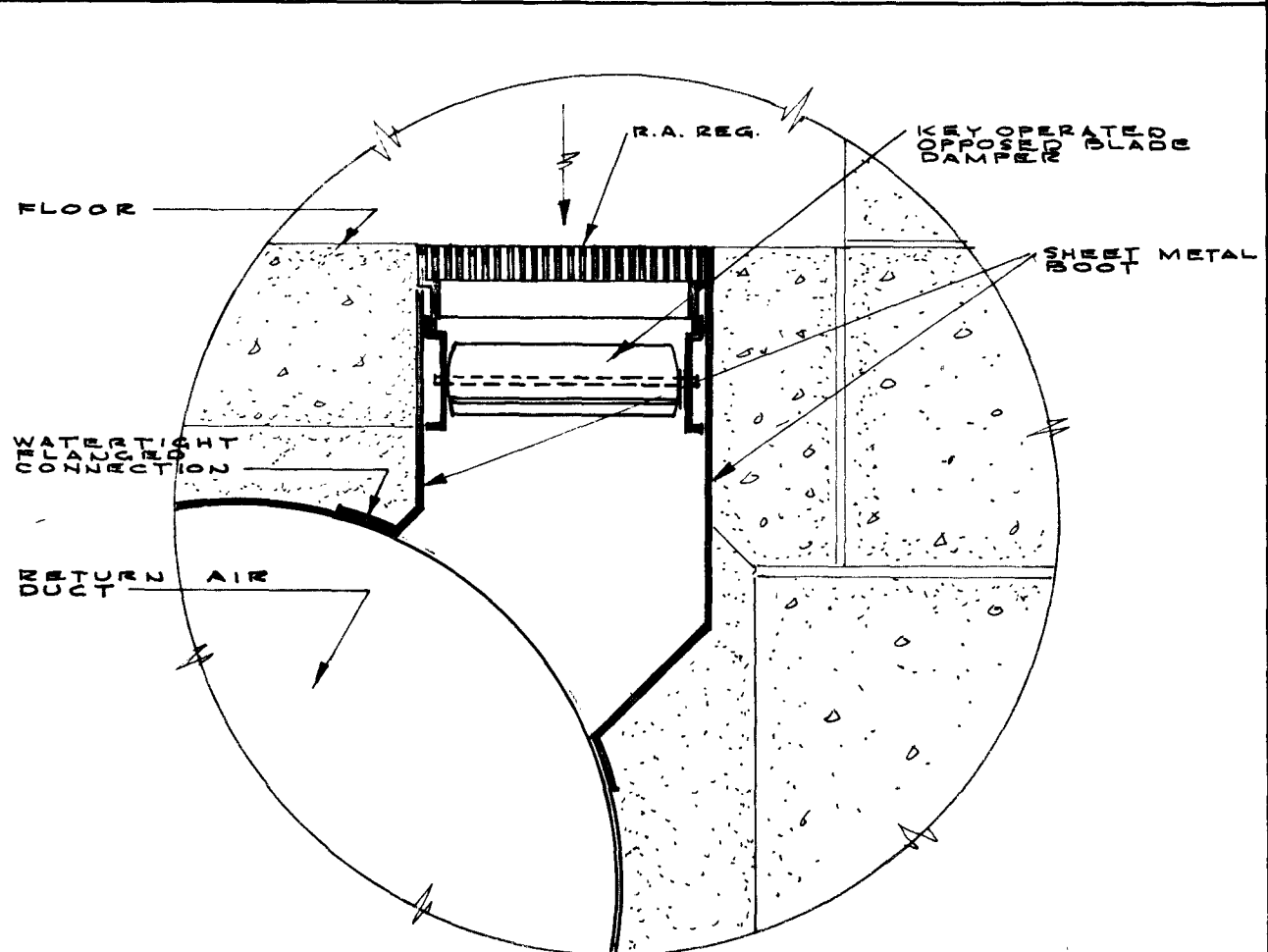
SECTION 1/M-2
SCALE 1/4" = 1'-0"



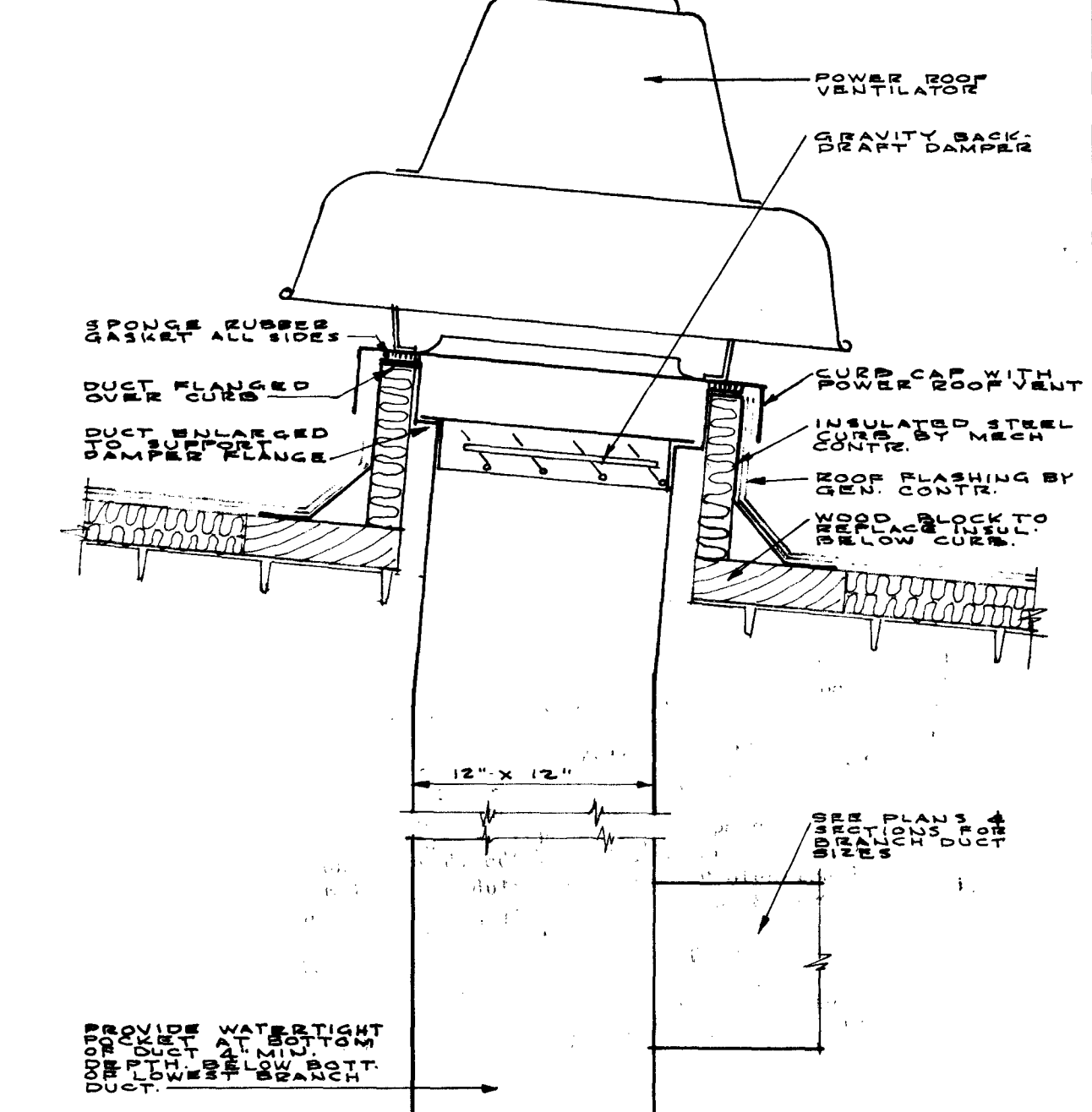
POWER ROOF VENTILATOR #2
SCALE 1/4" = 1'-0"
POWER ROOF VENTILATOR #1 INSTALLATION SIMILAR



RETURN AIR REGISTER CONNECTION
SCALE 3/4" = 1'-0"



RETURN AIR REG. - DETAIL "A"
SCALE 1/2" = 1'-0"

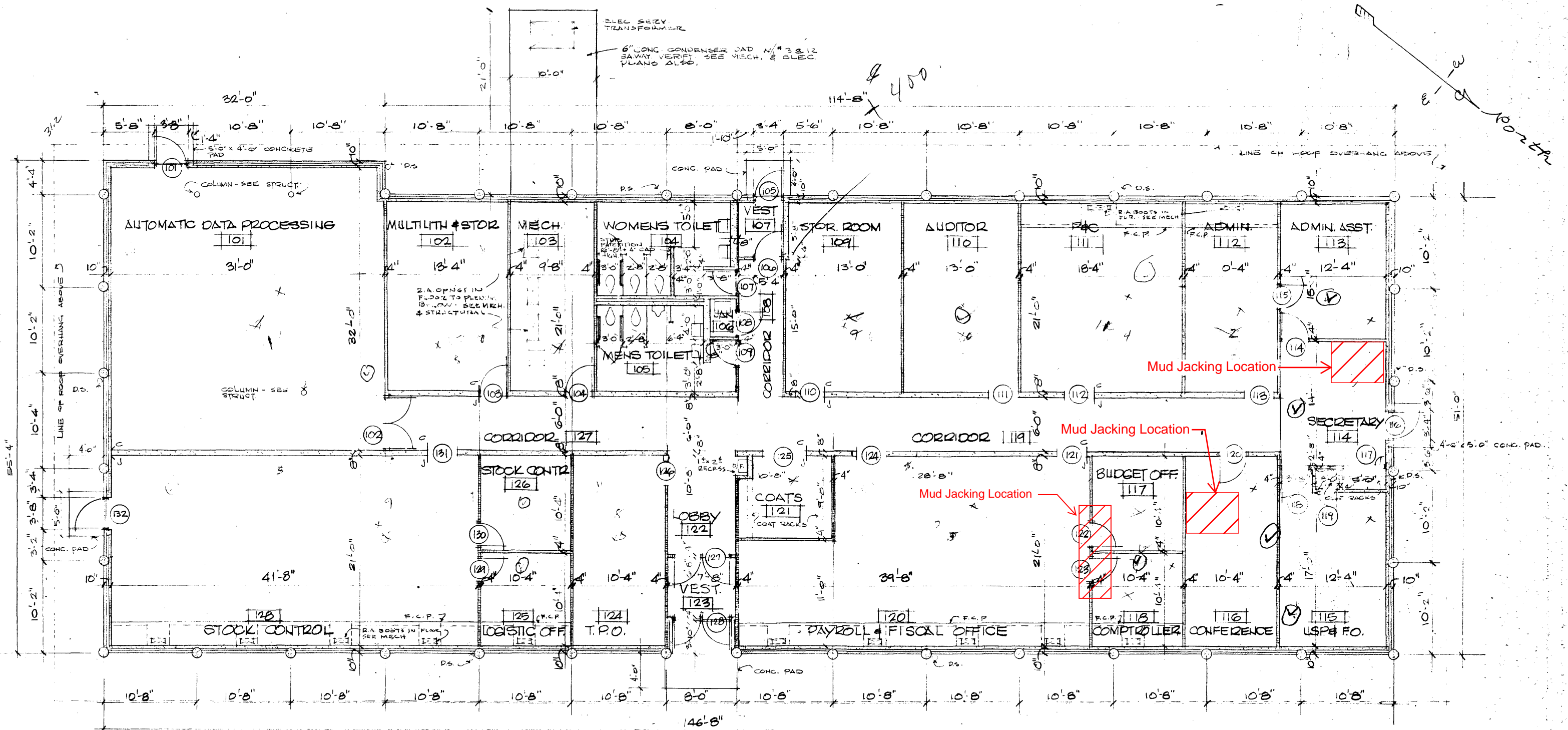


POWER ROOF VENTILATOR
SCALE 1/4" = 1'-0"

This study and plan, specification or report was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
Frank L. Pulley
Frank L. Pulley, P.E.
Date Aug 17, 1969 Rep. No. 2628

MECHANICAL - PART PLANS & DETAILS		BLDG 1966
OFFICE BUILDING		
UNITED STATES PROPERTY & FISCAL OFFICER		
IOWA NATIONAL GUARD		
CAMP DODGE IOWA		
MAJOR GENERAL JOSEPH G. MARY, ADJUTANT GENERAL OF IOWA		
CAMP DODGE P.O. BOX 616 DES MOINES, IOWA		OF 2 SHEETS
WETHERELL - HARRISON - WAGNER - MCKLVEEN		FILE 1-1
architects		DATE 6/9/69
320 HURSELL BUILDING DES MOINES, IOWA		
FRANK PULLEY ASSOCIATES INC.		
DES MOINES, IOWA		

Exhibit A-3 – Mud Jacking Location



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