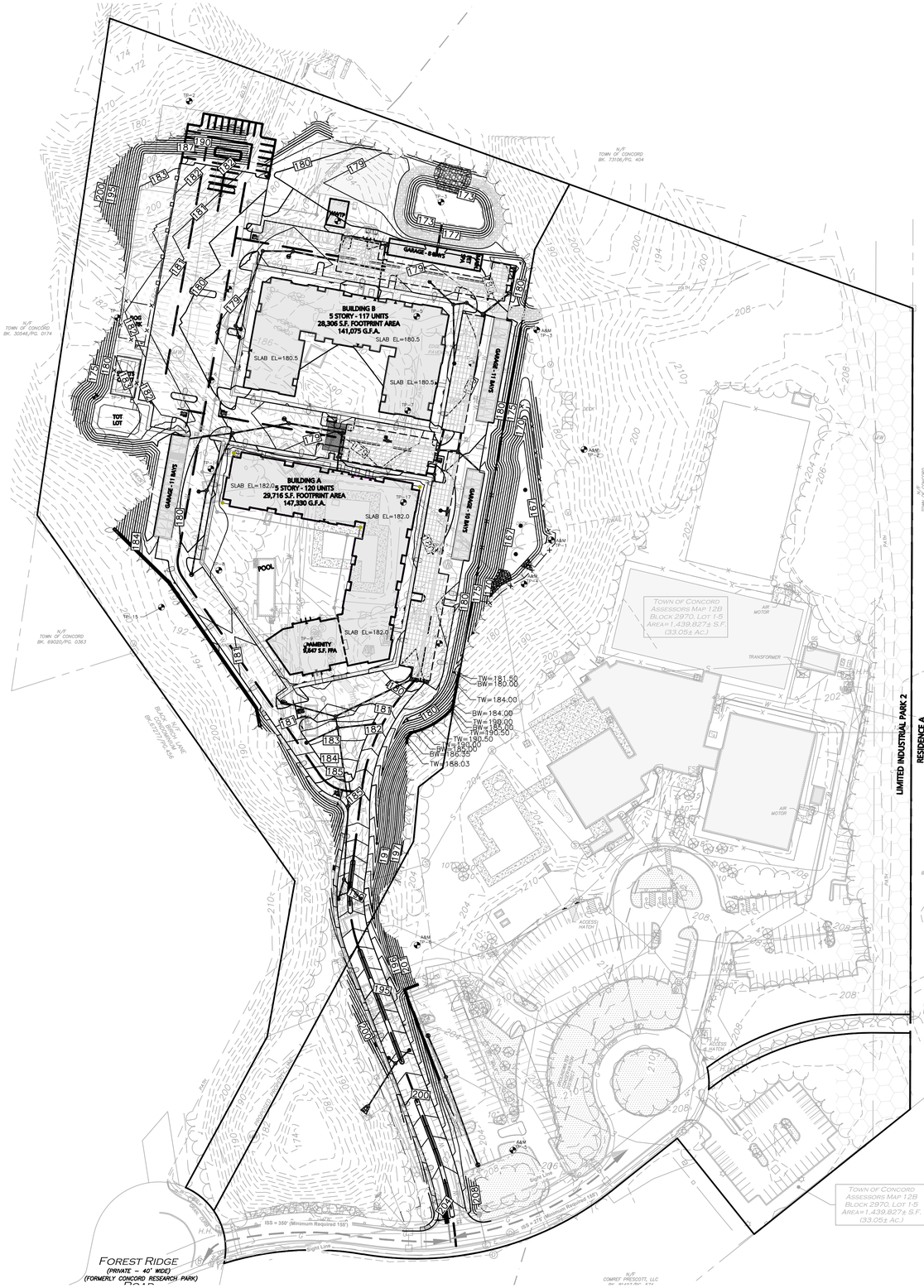

LEGEND

DRAIN MANHOLE (DMH)	◎
CATCH BASIN (CB)	◉
CATCH BASIN – DOUBLE GRATE	⊖
FLARED END SECTION (FES)	
DRAIN LINE	
RIPRAP OUTFALL	
HEADWALL	
5' CONTOUR	180
1' CONTOUR	177
SPOT GRADE	×180.50
INFILTRATION SYSTEM	
INFILTRATION CHAMBERS	
ISOLATOR ROW	
FLOW DIRECTION	⟹

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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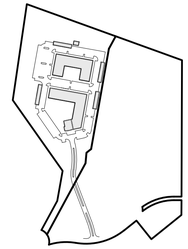

KEYSHEET

ISSUED FOR REVIEW
DEC. 20, 2023 REV FEB. 13,2025

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
04	02/13/25	LAYOUT REVISIONS PER WORKSHOP
03	01/23/25	LAYOUT REVISIONS PER WORKSHOP
02	10/18/24	ZBA RESUBMISSION
01	02/23/24	ZBA RESUBMISSION

APPLICANT\OWNER:

THOREAU RESIDENCES, LLC
275 FOREST RIDGE ROAD
CONCORD, MA 01742

PROJECT:

THE RESIDENCES AT THOREAU
275 FOREST RIDGE ROAD
CONCORD, MA 01742

PROJECT NO.	1670-24	DATE:	12/20/2023
SCALE:	1" = 80'	DWG. NAME:	C-1670-24
DESIGNED BY:	PGM	CHECKED BY:	PLC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
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TEL: (508) 923-1010
FAX: (508) 923-6309
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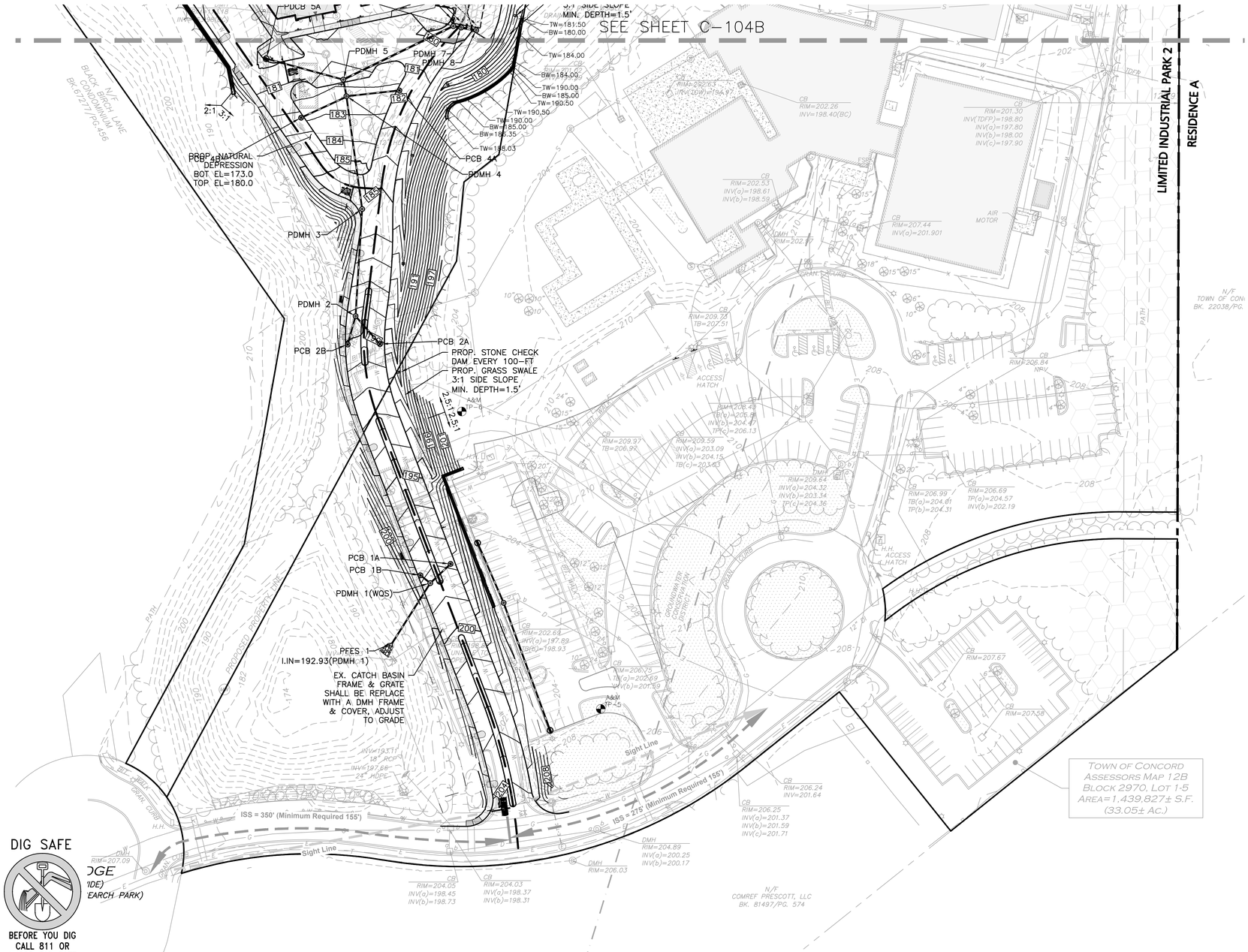
DRAWING TITLE:

OVERALL GRADING & DRAINAGE PLAN

SHEET No.

C-104



LEGEND

DRAIN MANHOLE (DMH)	⊙
CATCH BASIN (CB)	⊙
CATCH BASIN – DOUBLE GRATE	⊖
FLARED END SECTION (FES)	◁
DRAIN LINE	
RIPRAP OUTFALL	
HEADWALL	
5' CONTOUR	180
1' CONTOUR	177
SPOT GRADE	×180.50
INFILTRATION SYSTEM	
INFILTRATION CHAMBERS	
ISOLATOR ROW	
FLOW DIRECTION	⟹

NOTES:

1. GRADING SHOWN ON PLANS ARE GENERAL IN NATURE DEMONSTRATING INTENT FOR PERMITTING DRAWINGS AND DO NOT TAKE INTO ACCOUNT ALL DOOR LOCATIONS AND THE AMENITY COURTYARDS. THESE AREAS WILL NEED TO BE FINE GRADED AND COORDINATED WITH ARCHITECT AND LANDSCAPE ARCHITECT DURING THE SCHEMATIC DESIGN PHASE, DESIGN DEVELOPMENT PHASE, BUILDING PERMIT PHASE AND CONSTRUCTION DRAWING PHASE.
2. REFER TO SHEET C-104C TO DRAINAGE STRUCTURE AND PIPE TABLES.
3. THE FOLLOWING DRAINAGE STRUCTURES SHALL BE WATER QUALITY STRUCTURES:
   - 3.1. PDMH 1, PDMH 6, PDMH 11, PDMH 20, PDMH 26
   - 3.2. PCB 14A, PCB 17A

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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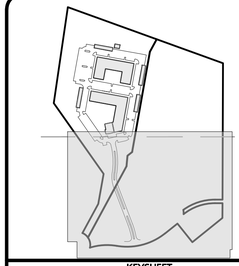

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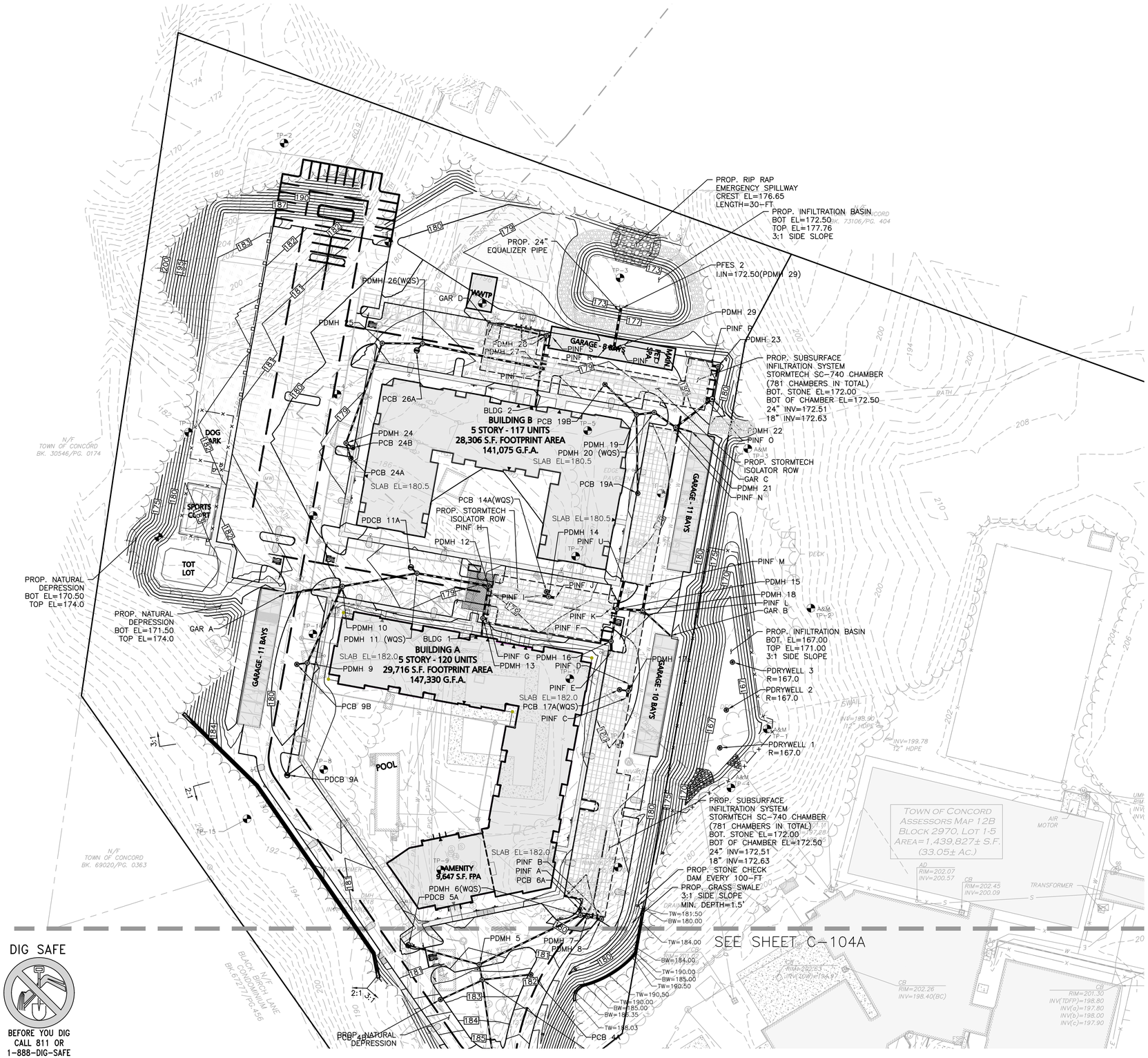
DRAWING TITLE:	SHEET No.
GRADING & DRAINAGE PLAN	C-104A



LEGEND

- DRAIN MANHOLE (DMH)
- CATCH BASIN (CB)
- CATCH BASIN – DOUBLE GRATE
- FLARED END SECTION (FES)
- DRAIN LINE
- RIPRAP OUTFALL
- HEADWALL
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- INFILTRATION SYSTEM
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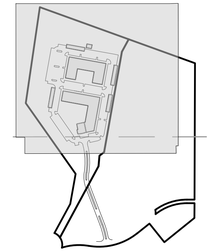

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DRAWING TITLE:

GRADING & DRAINAGE PLAN

SHEET No.

C-104B

DRAIN STRUCTURE TABLE

STRUCTURE	STRUCTURE DETAILS
PCB 1A	RIM = 197.83 INV OUT = 193.78 (PDMH 1)
PCB 1B	RIM = 197.83 INV OUT = 193.75 (PDMH 1)
PCB 2A	RIM = 190.13 INV OUT = 186.44 (PDMH 2)
PCB 2B	RIM = 190.13 INV OUT = 186.30 (PDMH 2)
PCB 4A	RIM = 181.72 INV OUT = 176.70 (PDMH 4)
PCB 4B	RIM = 182.29 INV OUT = 176.53 (PDMH 4)
PCB 6A	RIM = 179.57 INV OUT = 175.25 (PDMH 6)
PCB 9B	RIM = 179.17 INV OUT = 175.32 (PDMH 9)
PCB 14A	RIM = 178.23 INV OUT = 174.10 (PDMH 14)
PCB 17A	RIM = 179.40 INV OUT = 175.10 (PDMH 17)
PCB 19A	RIM = 178.25 INV OUT = 174.75 (PDMH 19)
PCB 19B	RIM = 178.53 INV OUT = 174.77 (PDMH 19)
PCB 24A	RIM = 178.45 INV OUT = 175.12 (PDMH 24)
PCB 24B	RIM = 178.44 INV OUT = 175.10 (PDMH 24)
PCB 26A	RIM = 178.39 INV OUT = 174.29 (PDMH 26)
PDCB 5A	RIM = 180.35 INV OUT = 176.10 (PDMH 5)
PDCB 9A	RIM = 180.04 INV OUT = 176.36 (PDMH 9)
PDCB 11A	RIM = 178.19 INV OUT = 174.20 (PDMH 11)

DRAIN STRUCTURE TABLE

STRUCTURE	STRUCTURE DETAILS
PDMH 1	RIM = 198.29 INV IN = 193.67 (PCB 1A) INV IN = 193.67 (PCB 1B) INV OUT = 193.57 (PFES 1)
PDMH 2	RIM = 189.25 INV IN = 185.60 (PCB 2A) INV IN = 185.60 (PCB 2B) INV OUT = 184.60 (PDMH 3)
PDMH 3	RIM = 185.39 INV IN = 179.81 (PDMH 2) INV OUT = 179.00 (PDMH 4)
PDMH 4	RIM = 182.34 INV IN = 176.50 (PDMH 3) INV IN = 176.50 (PCB 4B) INV IN = 176.50 (PCB 4A) INV OUT = 176.40 (PDMH 5)
PDMH 5	RIM = 181.30 INV IN = 175.61 (PDCB 5A) INV IN = 175.93 (PDMH 4) INV OUT = 175.36 (PDMH 6)
PDMH 6	RIM = 179.63 INV IN = 175.20 (PCB 6A) INV IN = 174.48 (PDMH 5) INV OUT = 174.23 (PDMH 7)
PDMH 7	RIM = 179.76 INV IN = 174.20 (PDMH 6) INV OUT = 173.02 (PDMH 8) INV OUT = 172.52 (PINF A)
PDMH 8	RIM = 180.11 INV IN = 173.02 (PDMH 7) INV OUT = 172.52 (PINF B)
PDMH 9	RIM = 179.35 INV IN = 175.25 (PCB 9B) INV IN = 175.25 (PDCB 9A) INV OUT = 175.00 (PDMH 10)
PDMH 10	RIM = 179.95 INV IN = 174.76 (GAR A) INV IN = 174.51 (PDMH 9) INV OUT = 174.41 (PDMH 11)
PDMH 11	RIM = 178.36 INV IN = 174.12 (PDCB 11A) INV IN = 173.87 (PDMH 10) INV OUT = 173.62 (PDMH 12)
PDMH 12	RIM = 178.91 INV IN = 173.03 (PDMH 13) INV IN = 173.20 (PDMH 11) INV OUT = 172.53 (PINF H)
PDMH 13	RIM = 179.51 INV IN = 176.03 (BLDG 1) INV OUT = 173.03 (PDMH 12) INV OUT = 172.53 (PINF G)
PDMH 14	RIM = 178.38 INV IN = 174.04 (PCB 14A) INV OUT = 172.54 (PINF I) INV OUT = 172.54 (PINF J)
PDMH 15	RIM = 179.58 INV OUT = 173.03 (PDMH 18) INV OUT = 172.51 (PINF U) INV OUT = 172.53 (PINF K) INV OUT = 173.03 (PDMH 16)

DRAIN STRUCTURE TABLE

STRUCTURE	STRUCTURE DETAILS
PDMH 16	RIM = 180.49 INV IN = 173.03 (PDMH 15) INV OUT = 172.53 (PINF E) INV OUT = 172.53 (PINF F)
PDMH 17	RIM = 179.69 INV IN = 175.00 (PCB 17A) INV OUT = 172.54 (PINF C) INV OUT = 172.54 (PINF D)
PDMH 18	RIM = 179.90 INV IN = 173.03 (PDMH 15) INV IN = 176.12 (GAR B) INV OUT = 172.53 (PINF L) INV OUT = 172.53 (PINF M)
PDMH 19	RIM = 179.74 INV IN = 174.37 (PCB 19A) INV IN = 174.37 (PCB 19B) INV OUT = 174.12 (PDMH 20)
PDMH 20	RIM = 179.77 INV IN = 174.05 (PDMH 19) INV OUT = 173.95 (PDMH 21)
PDMH 21	RIM = 179.32 INV IN = 173.84 (PDMH 20) INV IN = 175.00 (GAR C) INV OUT = 172.53 (PINF N) INV OUT = 173.03 (PDMH 22)
PDMH 22	RIM = 180.62 INV IN = 173.03 (PDMH 21) INV OUT = 173.03 (PDMH 23) INV OUT = 172.53 (PINF O)
PDMH 23	RIM = 181.27 INV IN = 173.03 (PDMH 22) INV OUT = 172.53 (PINF P)
PDMH 24	RIM = 178.59 INV IN = 175.00 (PCB 24A) INV IN = 175.00 (PCB 24B) INV OUT = 174.75 (PDMH 25)
PDMH 25	RIM = 178.90 INV IN = 174.23 (PDMH 24) INV OUT = 174.13 (PDMH 26)
PDMH 26	RIM = 178.56 INV IN = 173.95 (PDMH 25) INV IN = 174.20 (PCB 26A) INV OUT = 173.70 (PDMH 27)
PDMH 27	RIM = 179.29 INV IN = 173.11 (PDMH 26) INV IN = 174.26 (BLDG 2) INV OUT = 173.03 (PDMH 28) INV OUT = 172.53 (PINF T)
PDMH 28	RIM = 179.96 INV IN = 173.03 (PDMH 27) INV IN = 175.00 (GAR D) INV OUT = 172.53 (PINF S)
PDMH 29	RIM = 179.31 INV IN = 172.51 (PINF R) INV IN = 172.51 (PINF Q) INV OUT = 172.51 (PFES 2)

DRAIN PIPE TABLE

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
BLDG 1 – PDMH 13	12"	15.80'	3.00%	HDPE
BLDG 2 – PDMH 27	12"	37.08'	2.00%	HDPE
GAR A – PDMH 10	12"	56.96'	1.00%	HDPE
GAR B – PDMH 18	12"	38.21'	1.00%	HDPE
GAR C – PDMH 21	12"	15.42'	2.00%	HDPE
GAR D – PDMH 28	12"	58.14'	1.00%	HDPE
PCB 1A – PDMH 1	12"	22.02'	0.50%	HDPE
PCB 1B – PDMH 1	12"	7.71'	1.00%	HDPE
PCB 2A – PDMH 2	12"	30.54'	2.75%	HDPE
PCB 2B – PDMH 2	12"	23.44'	3.00%	HDPE
PCB 4A – PDMH 4	12"	47.58'	0.42%	HDPE
PCB 4B – PDMH 4	12"	44.77'	0.08%	HDPE
PCB 6A – PDMH 6	12"	3.95'	1.34%	HDPE
PCB 9B – PDMH 9	12"	6.63'	1.00%	HDPE
PCB 14A – PDMH 14	12"	1.52'	4.00%	HDPE
PCB 17A – PDMH 17	12"	4.88'	2.00%	HDPE
PCB 19A – PDMH 19	12"	75.64'	0.50%	HDPE
PCB 19B – PDMH 19	12"	40.26'	1.00%	HDPE
PCB 24A – PDMH 24	12"	12.12'	1.00%	HDPE
PCB 24B – PDMH 24	12"	4.30'	2.33%	HDPE
PCB 26A – PDMH 26	12"	4.48'	2.00%	HDPE
PDCB 5A – PDMH 5	12"	69.82'	0.70%	HDPE
PDCB 9A – PDMH 9	12"	110.74'	1.00%	HDPE

DRAIN PIPE TABLE

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
PDCB 11A – PDMH 11	12"	4.09'	2.00%	HDPE
PDMH 1 – PFES 1	12"	64.54'	1.00%	HDPE
PDMH 2 – PDMH 3	12"	95.85'	5.00%	HDPE
PDMH 3 – PDMH 4	12"	102.10'	2.45%	HDPE
PDMH 4 – PDMH 5	12"	11.65'	4.00%	HDPE
PDMH 5 – PDMH 6	15"	109.86'	0.80%	HDPE
PDMH 6 – PDMH 7	18"	3.45'	1.00%	HDPE
PDMH 7 – PDMH 8	18"	10.25'	0.00%	HDPE
PDMH 7 – PINF A	24"	2.30'	0.50%	HDPE
PDMH 8 – PINF B	24"	2.30'	0.50%	HDPE
PDMH 9 – PDMH 10	15"	81.27'	0.60%	HDPE
PDMH 10 – PDMH 11	15"	72.70'	0.75%	HDPE
PDMH 11 – PDMH 12	18"	69.69'	0.60%	HDPE
PDMH 12 – PINF H	24"	3.44'	0.50%	HDPE
PDMH 13 – PDMH 12	18"	29.25'	0.00%	HDPE
PDMH 13 – PINF G	24"	3.44'	0.50%	HDPE
PDMH 14 – PINF I	24"	5.40'	0.50%	HDPE
PDMH 14 – PINF J	24"	4.84'	0.56%	HDPE
PDMH 15 – PDMH 16	18"	29.25'	0.00%	HDPE
PDMH 15 – PDMH 18	18"	22.19'	0.00%	HDPE
PDMH 15 – PINF K	24"	3.44'	0.50%	HDPE
PDMH 15 – PINF U	24"	28.05'	0.00%	HDPE
PDMH 16 – PINF E	24"	8.95'	0.19%	HDPE

DRAIN PIPE TABLE

PIPE SEGMENT	SIZE	LENGTH	SLOPE	MATERIAL
PDMH 16 – PINF F	24"	10.56'	0.16%	HDPE
PDMH 17 – PINF C	24"	5.12'	0.51%	HDPE
PDMH 17 – PINF D	24"	5.12'	0.50%	HDPE
PDMH 18 – PINF L	24"	2.67'	0.64%	HDPE
PDMH 18 – PINF M	24"	24.57'	0.07%	HDPE
PDMH 19 – PDMH 20	15"	14.09'	0.50%	HDPE
PDMH 20 – PDMH 21	15"	22.40'	0.50%	HDPE
PDMH 21 – PDMH 22	18"	42.20'	0.00%	HDPE
PDMH 21 – PINF N	24"	3.00'	0.50%	HDPE
PDMH 22 – PDMH 23	18"	28.86'	0.00%	HDPE
PDMH 22 – PINF O	24"	4.90'	0.35%	HDPE
PDMH 23 – PINF P	24"	5.40'	0.31%	HDPE
PDMH 24 – PDMH 25	15"	103.50'	0.50%	HDPE
PDMH 25 – PDMH 26	15"	36.75'	0.50%	HDPE
PDMH 26 – PDMH 27	18"	118.05'	0.50%	HDPE
PDMH 27 – PDMH 28	18"	29.25'	0.00%	HDPE
PDMH 27 – PINF T	24"	3.44'	0.50%	HDPE
PDMH 28 – PINF S	24"	3.44'	0.50%	HDPE
PDMH 29 – PFES 2	24"	38.32'	0.03%	HDPE
PINF Q – PDMH 29	24"	5.12'	0.00%	HDPE
PINF R – PDMH 29	24"	5.12'	0.00%	HDPE

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GRAPHIC SCALE

50 0 25 50 100 200

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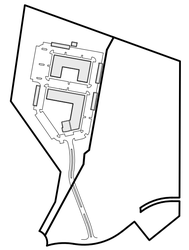

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DRAWING TITLE:	SHEET No.
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