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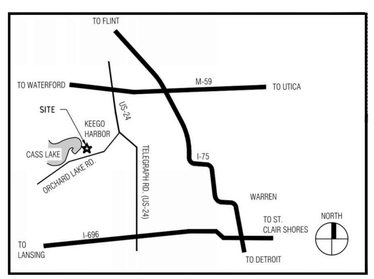
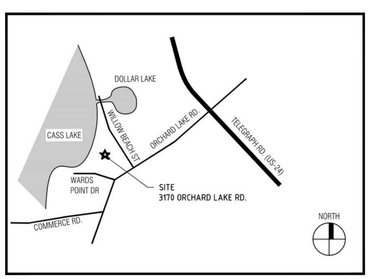
ARCHITECT	**NEUMANN/SMITH ARCHITECTURE** 400 GALLERIA OFFICENTRE, SUITE 555 SOUTHFIELD, MICHIGAN 48034 (248) 352-8310
DESIGN ARCHITECT	**ROBERT A.M. STERN ARCHITECTS, LLP** ONE PARK AVE. NEW YORK, NY 10016 (212) 967-5100
CONSTRUCTION MANAGER	**ROCKFORD CONSTRUCTION** 155 W. CONGRESS ST STE. 505 DETROIT, MI 48226 (313) 309-9854
CIVIL ENGINEER	**NOWAK & FRAUS ENGINEERS** 46777 WOODWARD AVE. PONTIAC, MI 48342-5032 (248) 332-8257
LANDSCAPE ARCHITECT	**OSD OUTSIDE** 250 WEST BROADWAY 2ND FLOOR NEW YORK, NEW YORK 10013 (917) 533-5586
STRUCTURAL ENGINEER	**IMEG CORP(IMEG)** 33533 TWELVE MILE ROAD SUITE 200 FARMINGTON HILLS, MI 48331 (248) 932-2010
MECH / ELECT ENGINEER	**MA ENGINEERING** 180 HIGH OAK ROAD BLOOMFIELD HILLS, MI 48304 (248) 258-1610

LOCATION MAP



VICINITY MAP



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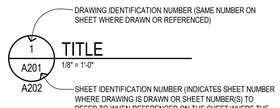
Job Number: **2020142**

Title: **TITLE SHEET**

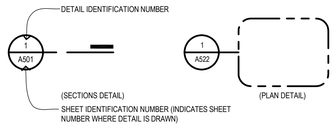
Sheet: **A001**

REFERENCE SYMBOLS

DRAWING (DETAIL, SECTION, ELEVATION, ETC.) IDENTIFICATION



DETAIL LOCATION INDICATION



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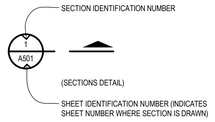

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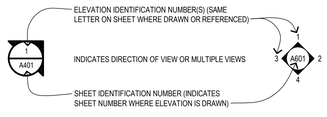

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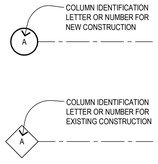

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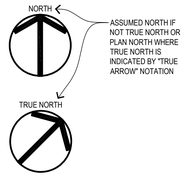

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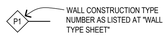
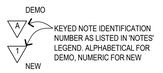
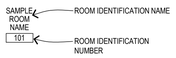


KEYED NOTE INDICATION



ROOM NAME & NUMBER



DOOR INDICATION

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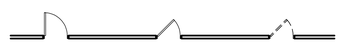

STANDARD ABBREVIATIONS

ACP - ACOUSTIC CEILING PANEL	CW - COLD WATER	FAB - FABRIC	IIC - IMPACT ISOLATION CLASS	NIC - NOT IN CONTRACT	RF - RUBBER FLOORING	UNO - UNLESS NOTED OTHERWISE
ADD - ADDENDUM		FD - FLOOR DRAIN	IN - INCH, INCHES	NTS - NOT TO SCALE	RO - ROUGH OPENING	UPH - UPHOLSTERY
AESS - ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	DCMU - DECORATIVE CONCRETE MASONRY UNIT	FE - FIRE EXTINGUISHER	INCL - INCLUDING, INCLUSIVE		RP - RESIN PANEL	UR - URINAL
	DEFS - DIRECT-APPLIED EXTERIOR FINISH SYSTEM	FEC - FIRE EXTINGUISHER CABINET	INSUL - INSULATION	OC - ON CENTER	RTR - RESILIENT TREADS/RISERS	
AFF - ABOVE FINISHED FLOOR		FHC - FIRE HOSE CABINET		OD - OUTSIDE DIAMETER		VCT - VINYL COMPOSITION TILE
ALT - ALTERNATE	DEMO - DEMOLISH, DEMOLITION	FDN - FOUNDATION	JC - JANITOR'S CLOSET	OFCI - OWNER FURNISHED, CONTRACTOR INSTALLED	SF - SPORT FLOORING	VERT - VERTICAL
ALUM - ALUMINUM	DF - DRAPERY FABRIC	FRP - FIBERGLASS REINFORCED PANEL			SIM - SIMILAR	VIF - VERIFY IN FIELD
ANOD - ANODIZED	DIA - DIAMETER	FRT - FIRE RETARDANT TREATED	LAV - LAVATORY	OFOI - OWNER FURNISHED, OWNER INSTALLED	SPEC - SPECIFICATION	
AP - ACRYLIC PANELS	DIM - DIMENSION	FT - FOOT, FEET	LF - LINEAL FOOT / FEET	OPP - OPPOSITE	SQFT - SQUARE FEET	WC - WATER CLOSET
	DN - DOWN	FWC - FABRIC WALL COVERING	LIN - LINOLEUM		SS - STAINLESS STEEL	WD - WOOD
BD - BOARD	DS - DOWNSPOUT	FWP - FABRIC WRAPPED PANEL	LLH - LONG LEG HORIZONTAL	P - PAINT	SSM - SOLID SURFACE MATERIAL	WDB - WOOD BASE
BF - BARRIER FREE	DW - DISHWASHER	FWTP - FABRIC WRAPPED TACKABLE PANEL	LLV - LONG LEG VERTICAL	PFN - PRE-FINISHED	STC - SOUND TRANSMISSION COEFFICIENT	WDF - WOOD FLOORING
BLDG - BUILDING	DWG(S) - DRAWING(S)		LTS - LINOLEUM TACKABLE SURFACE	PL - PLASTIC LAMINATE	ST - STONE	WLC - WALL COVERING
BOS - BOTTOM OF STEEL		GA - GAUGE	LVT - LUXURY VINYL TILE	PSF - POUNDS PER SQUARE FOOT	STN - STAIN	WPFG - WATERPROOFING
BULL - BULLETIN	EA - EACH	GALV - GALVANIZED		PSI - POUNDS PER SQUARE INCH		WP - WORK POINT
	EIFS - EXTERIOR INSULATION AND FINISH SYSTEM	GB - GYPSUM BOARD	MAT - ENTRANCE MAT	PVC - POLYVINYL CHLORIDE	T - TILE (CERAMIC, PORCELAIN)	WD - WOOD
CB - CONCRETE BRICK		GFRC - GLASS FIBER REINFORCED CONCRETE	MAX - MAXIMUM		TB - TILE BASE (CERAMIC, PORCELAIN)	
CG - CORNER GUARD	EJ - EXPANSION JOINT	GL - GLASS	MB - MARKER BOARD	QSSM - QUARTZ SOLID SURFACING MATERIAL	TBD - TO BE DETERMINED	
CJ - CONTROL JOINTS	EL - ELEVATION	GLBL - GLASS BLOCK	MECH - MECHANICAL	QT - QUARRY TILE	T&G - TONGUE AND GROOVE	
CL - CENTER LINE	EM - EMERGENCY	GLT - GLASS TILE	MFR - MANUFACTURER	QTB - QUARRY TILE BASE	THK - THICKNESS	
CLG - CEILING	EOS - EDGE OF SLAB	GMB - GLASS MARKER BOARD	MIN - MINIMUM	QZ - QUARTZ, NATURAL STONE	THOLD - THRESHOLD	
CLO - CLOSET	EQ - EQUAL		MISC - MISCELLANEOUS		TOS - TOP OF STEEL	
CMU - CONCRETE MASONRY UNIT	EQUIP - EQUIPMENT	HM - HOLLOW METAL	MJ - MOVEMENT JOINT	RB - RESILIENT BASE	TRANS - TRANSPARENT	
COL - COLUMN	EWC - ELECTRIC WATER COOLER	HW - HOT WATER	MO - MASONRY OPENING	REF - REFRIGERATOR	TYP - TYPICAL	
CONC - CONCRETE	EX - EXISTING	HORZ - HORIZONTALLY	MTL - METAL	REINF - REINFORCED, REINFORCING	TZ - TERRAZZO	
CONC-S - CONCRETE – SEALED	EXIST - EXISTING	HPC - HIGH PERFORMANCE COATING	MW - MICROWAVE OVEN	REQD - REQUIRED	TZT - TERRAZZO TILE	
CPT - CARPET	EXP - EXPANSION	HT - HEIGHT		RES - RESILIENT FLOORING		
CPTB - CARPET BASE			NAF - NO ADDITIONAL FINISH	RD - ROOF DRAIN	UL - UNDERWRITER'S LABORATORY	

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•			C-02	PUD - DEMOLITION PLAN
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			M001	
				FIRE PROTECTION
			F001	
				ELECTRICAL
			E001	

• DRAWINGS ISSUED

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Title: **INDEX OF DRAWINGS & ARCHITECTURAL DRAWING STANDARDS**

Sheet: **A002**

SITE DATA	
PARCEL I.D.	18-02-434-008 / 18.02-434-019
ADDRESS	3170 ORCHARD LAKE ROAD, KEEGO HARBOR, MI
ZONING	PUD - PLANNED UNIT DEVELOPMENT
PARCEL AREA	231,971 SQUARE FEET (5.33 ACRES)

ZONING SCHEDULE OF REGULATIONS		
REGULATION	REQUIRED (RMH DISTRICT)	FINAL P.U.D.
SETBACKS:		
MINIMUM FRONT YARD SETBACK	50.0'	24.0'
MINIMUM SIDE YARD SETBACK (ONE SIDE)	10.0'	10.5'
MINIMUM SIDE YARD SETBACK (TOTAL)	20.0'	102.5'
MINIMUM REAR YARD SETBACK	10.0'	32.5'
MINIMUM LAKE SETBACK	=/-64.0' (SEE C-02 FOR CALCULATION)	98.4'
MINIMUM LOT AREA	435,600 SF (10 ACRES)	231,996 SF (5.33 ACRES)
MAXIMUM BUILDING HEIGHT	35.0' (2.5 STORIES)	73'-6" TO MIDPOINT OF SLOPED ROOF 88'-0" TO TOP OF PARAPET/ RIDGE (6 STORIES)
MINIMUM FLOOR AREA	600.0 SF	>500.0 SF 870.0 SF AVERAGE
MINIMUM RECREATIONAL OPEN SPACE	25,000.0 SF	28,114 SF OUTDOOR G.S. + 24,336 SF OUTDOOR O.S.+ 31,113 SF INDOOR AMENITY 83,563 TOTAL SF
MAXIMUM LOT COVERAGE	30.0%	65,654 SF (28.3%)
MINIMUM PARKING SPACE TOTAL	574 SPACES	439 SPACES
MINIMUM GREENBELT	7.0' HIGH FENCE AND/OR 10.0' WIDE GREENBELT	6' MASONRY SCREEN WALL

PARKING AND LOADING REQUIREMENTS	
REGULATION	AMENDED PRELIMINARY PUD (01/03/2019)
MULTI-FAMILY DWELLING 2 SPACES PER DWELLING UNIT (2 BEDROOMS OR LESS) = 446 SPACES 2.5 SPACES PER DWELLING UNIT (MORE THAN 2 BEDROOMS) = 38 SPACES RETAIL 4,853 USF/ 1 SPACE PER 150 SF OF USABLE FLOOR AREA = 33 SPACES PRIVATE CLUBS OR LODGE HALLS 1 SPACE FOR EACH 3 PERSONS ALLOWED WITHIN THE MAXIMUM OCCUPANCY LOAD (NOTE: EXCLUSIVE RESIDENCE AMENITIES INCLUDE THE FITNESS, PARLOR, HEARTH, SPA, GAMING, CLUB AND BUSINESS CENTER ROOMS. PARKING FOR THESE AREAS ARE FIGURED WITH THE DWELLING UNITS) RESTAURANT + BAR DINING ROOM AND BAR AREAS: 2,846 USF/ 1 SPACE PER 50 SQUARE FEET OF USABLE FLOOR AREA = 57 SPACES	447 SPACES
MINIMUM 90° PARKING 9.0' X 20.0' WITH 20.0' AISLE	9.0' X 18.0' WITH 24.0' AISLE 9.0' X 20' WITH 20.0' AISLE BASEMENT PARKING 9.0'X17.5' WITH 26.0' PARKING ALONG FIRE LANE
MINIMUM 0° PARKING 8.0' X 26.0' WITH 20.0' AISLE	8.0' X 26.0' WITH 26.0' AISLE 80' X 27.75' WITH 20.0' AISLE AT ADA LOADING
MINIMUM 45° PARKING 12.0' X 20.0' WITH 12.0' AISLE	9.0' X 18.5' WITH 26.0' AISLE
MINIMUM STREET WIDTH (R-MH DISTRICT) 21.0' (TWO-WAY WITH NO PARALLEL PARKING) 31.0' (TWO-WAY WITH PARALLEL PARKING ON ONE SIDE) 41.0' (TWO-WAY WITH PARALLEL PARKING ON BOTH SIDES) 13.0' (ONE-WAY WITH NO PARALLEL PARKING) 23.0' (ONE WAY WITH PARALLEL PARKING ON ONE SIDE) 33.0' (ONE-WAY WITH PARALLEL PARKING ON BOTH SIDES)	 24.0' 26.0' N/A 20.0' N/A N/A
MINIMUM PEDESTRIAN WALKWAY WIDTH (R-MH DISTRICT) 3.0'	7.0'
LOADING ZONE (COMMERCIAL USES OVER 10,00 GROSS SF) ONE 10' X 40' (400SF) LOADING ZONE	2 LOADING ZONES +/- 1,658 SF

LEVEL	UNIT TYPE (AVERAGE SF) STUDIO (600 SF)	1 BEDROOM (680 SF)	2 BEDROOM (975 SF)	3 BEDROOM (1585 SF)	TOTAL
GROUND	0	0	0	0	0
2ND LEVEL	6	18	22	3	49
3RD LEVEL	6	18	22	3	49
4TH LEVEL	6	18	22	3	49
5TH LEVEL	6	18	22	3	49
6TH LEVEL	4	13	22	3	42
TOTAL	**28**	**85**	**110**	**15**	**238**
PERCENTAGES	**12%**	**36%**	**46%**	**6%**	**100%**

LEVELS	SQUARE FEET
LEVEL 00	28,085
GROUND LEVEL	51,291
2ND LEVEL	53,165
3RD LEVEL	53,165
4TH LEVEL	52,341
5TH LEVEL	50,525
6TH LEVEL	49,009
TOTAL	337,581

GRADE LEVEL PARKING
51 PARKING SPACES
4 BF PARKING SPACES
55 GRADE LEVEL SPACES

PARKING STRUCTURE PARKING

LEVEL -02	64 SPACES
LEVEL -01	64 SPACES
LEVEL 01	41 SPACES
LEVEL 02	43 SPACES
LEVEL 03	43 SPACES
LEVEL 04	43 SPACES
LEVEL 05	43 SPACES
LEVEL 06	43 SPACES

384 HOIST PARKING SPACES

439 TOTAL PARKING SPACES

1 AC101 SITE PLAN
SCALE: 1/32" = 1'-0"

0'-0" 32'-0" 64'-0" 96'-0"

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Title **ARCHITECTURAL SITE PLAN AND ZONING INFORMATION**

Sheet **AC101**

1 AC102 OVERAL SITE PLAN
SCALE: 1/64" = 1'-0"

0'-0" 64'-0" 128'-0" 192'-0"

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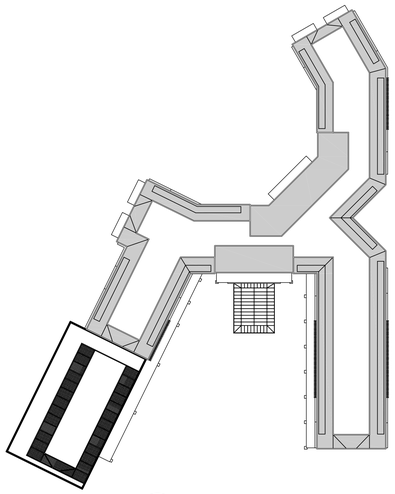
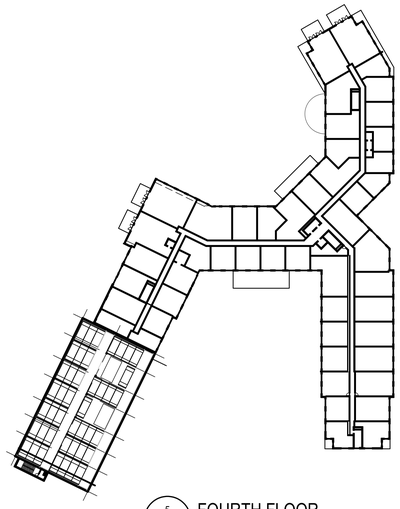
Title: **OVERALL ARCHITECTURAL SITE PLAN**

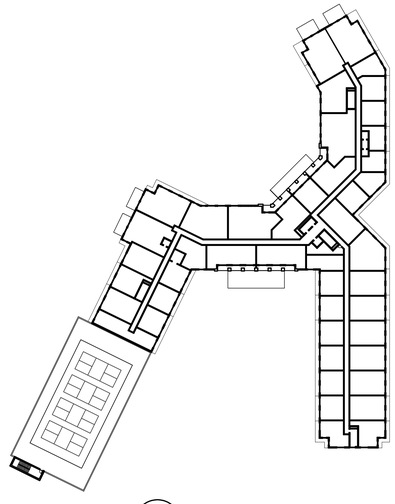
Sheet: **AC102**



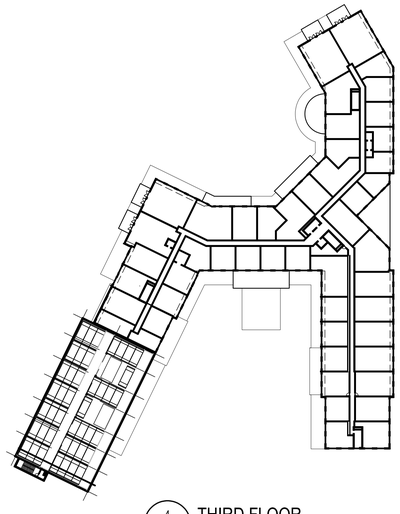
8 AC103 ROOF PLAN
SCALE: 1/64" = 1'-0"



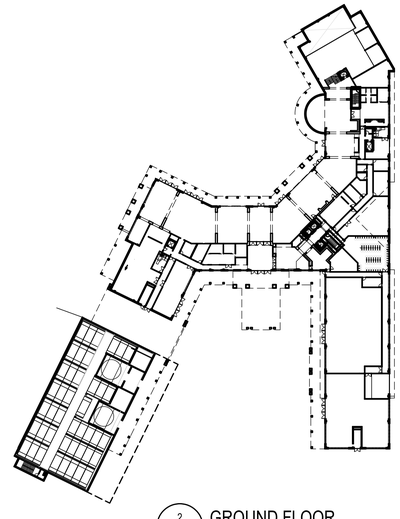
5 AC103 FOURTH FLOOR
SCALE: 1/64" = 1'-0"



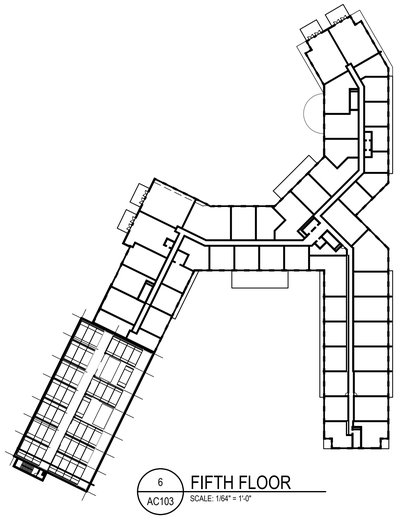
7 AC103 SIXTH FLOOR
SCALE: 1/64" = 1'-0"



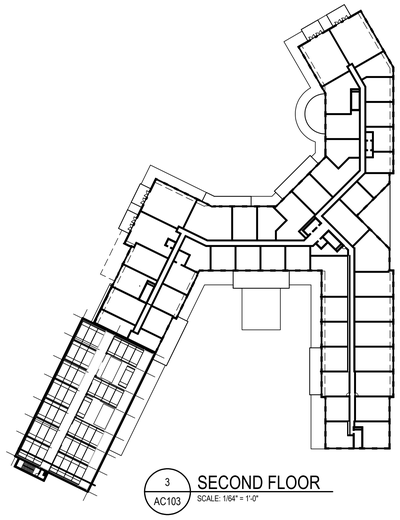
4 AC103 THIRD FLOOR
SCALE: 1/64" = 1'-0"



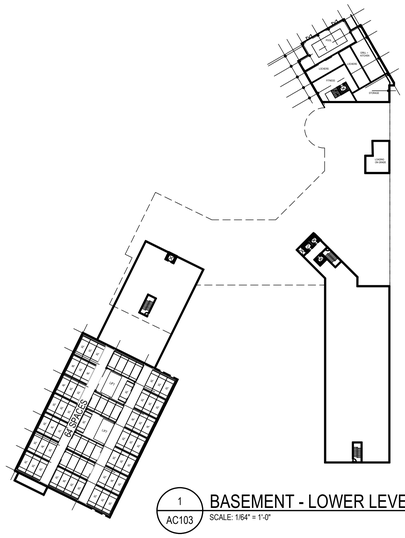
2 AC103 GROUND FLOOR
SCALE: 1/64" = 1'-0"



6 AC103 FIFTH FLOOR
SCALE: 1/64" = 1'-0"



3 AC103 SECOND FLOOR
SCALE: 1/64" = 1'-0"



1 AC103 BASEMENT - LOWER LEVEL PARKING
SCALE: 1/64" = 1'-0"

CODES OF JURISDICTION

JURISDICTION	CITY OF KEEGO HARBOR, MICHIGAN 48320
BUILDING CODE	2015 MICHIGAN BUILDING CODE (2015 MBC)
BARRIER FREE CODE	MICHIGAN ACT 1 OF 1966, ICC A117.1-09 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES AND 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
ENERGY CODE	MICHIGAN ENERGY CODE PART 10 INCORPORATING THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE WITH MICHIGAN AMENDMENTS, ADDITIONS OR DELETIONS
PLUMBING CODE	2018 MICHIGAN PLUMBING CODE (2018 MPC)
MECHANICAL CODE	2015 MICHIGAN MECHANICAL CODE (2015 MMC)
ELECTRICAL CODE	MICHIGAN ELECTRICAL CODE BASED ON THE 2017 NATIONAL ELECTRIC CODE WITH PART 8 STATE AMENDMENT (2017 NEC)
ELEVATOR CODE	2010 MICHIGAN ELEVATOR RULES, INCORPORATING ASME, A17.1-2010 SAFETY CODE FOR ELEVATORS AND ESCALATORS WITH MICHIGAN AMENDMENT, ADDITIONS OR DELETIONS
FIRE CODE	2015 INTERNATIONAL FIRE CODE (2015 IFC)
FAIR HOUSING ACT	1998 FAIR HOUSING ACT DESIGN MANUAL
SPRINKLER SYSTEMS STANDARD	2013 NFPA 13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
FIRE ALARM CODE	2013 NRPA 72 FIRE ALARM CODE
FOOD CODE	2009 FDA FOOD CODE AS ADOPTED BY THE MICHIGAN FOOD LAW WITH MICHIGAN AMENDMENTS, ADDITIONS OR DELETIONS

CODE COMPLIANCE DATA -2015 MBC

USE GROUP CLASSIFICATION	A-3: ASSEMBLY, B:BUSINESS, M: MERCANTILE, R-2:RESIDENTIAL, S-1:MODERATE-HAZARD STORAGE, S-2: LOW-HAZARD STORAGE	
MIXED USE GROUP CLASSIFICATION	SEPARATED - 1 HOUR BETWEEN S-2 & B/M/S-1	
MINIMUM CONSTRUCTION REQUIREMENTS	IB (403.2.1.1 ITEM 2, REDUCTION TO IIA RATINGS)	
ALLOWABLE SINGLE FLOOR CODE AREA		
A-2 & A-3:ASSEMBLY USE	UNLIMITED	
B: BUSINESS	UNLIMITED	
M: MERCANTILE	UNLIMITED	
R-2: RESIDENTIAL	UNLIMITED	
S-1: MODERATE-HAZARD STORAGE	144,000	
S-2: LOW-HAZARD STORAGE	237,000	
ALLOWABLE AREA INCREASES		
% OPEN PERIMETER =	N/A UNLIMITED BUILDING	
% INCREASE FOR AUTOMATIC SPRINKLERS	N/A UNLIMITED BUILDING	
MAXIMUM ALLOWABLE AREA WITH INCREASES PER FLOOR	N/A UNLIMITED BUILDING	
ACTUAL PROPOSED CODE GROSS FLOOR AREAS:		
	BUILDING	PARKING STRUCTURE
BASEMENT LEVEL 0	29,536	18,536
AMENITY/PUBLIC - LEVEL 1	52,206	13,433
RESIDENTIAL - LEVEL 2	54,115	13,433
RESIDENTIAL - LEVEL 3	52,958	13,433
RESIDENTIAL - LEVEL 4	51,949	13,433
RESIDENTIAL - LEVEL 5	50,631	13,433
RESIDENTIAL - LEVEL 6	48,888	13,433
TOTAL CODE GROSS AREA:	340,283	99,134
NUMBER OF STORIES		
NUMBER OF STORIES ALLOWED	12 ABOVE GRADE (SPRINKLED PER NFPA 13)	
NUMBER OF STORIES PROPOSED	6 ABOVE GRADE (SPRINKLED PER NFPA 13)	
BUILDING HEIGHT		
TABULAR HEIGHT (A,B,M,R,S)	180'-0" ABOVE GRADE PLANE	
PROPOSED HEIGHT	70'-0" ABOVE GRADE PLANE	
INCIDENTAL USE AREAS		
TRASH CHUTE ACCESS ROOM	1 HOUR	
TRASH CHUTE DISCHARGE ROOM	2 HOUR	
EQUIPMENT OVER 400,000 BTU/HOUR	AUTOMATIC FIRE SUPPRESSION SYSTEM (NFPA 13)	
TRANSFORMERS OVER 112.5 KVA (NEC 2018)	1 HOUR RATED SEPARATION	
SPECIAL USE & OCCUPANCY REQUIREMENTS: HIGH RISE BUILDINGS (MBC 403)		
AUTOMATIC FIRE SUPPRESSION SYSTEM	PER NFPA 13	
SMOKE DETECTION	PER NFPA 72 & MBC SECTIONS 907.2.13.1.1 AND 907.2.13.1.2	
FIRE ALARM SYSTEM	PER NFPA72	
STANDPIPE SYSTEM	CLASS 1 (MBC 905.3 EXCEPTION 1)	
EMERGENCY VOICE/ALARM COMMUNICATION	PER NFPA 72	
EMERGENCY RESPONDER RADIO COMMUNICATION	PER SECTION 510 IFC	
FIRE COMMAND CENTER	200 SF MINIMUM SEPARATED WITH 1 HOUR FIRE BARRIERS - FIRE	
FIRE PUMP ROOM	SEPARATED WITH 2 HOUR FIRE BARRIERS	
POST-FIRE SMOKE REMOVAL	MANUALLY OPERABLE WINDOWS	
STAND BY POWER SYSTEM FOR:	FIRE COMMAND CENTER POWER AND LIGHTING, VENTILATION, AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF	
EMERGENCY POWER SYSTEM FOR:	EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION, FIRE ALARM SYSTEMS, ELEVATOR CAR LIGHTING, AUTOMATIC FIRE DETECTIONS SYSTEMS, EMERGENCY VOICE/ALARM COMMUNICATION	
FIRE RESISTANCE RATING / TYPE IIA CONSTRUCTION (REDUCTION ALLOWABLE PER MBC 403.2.1.1)		
	REQUIRED	PROVIDED
EXTERIOR WALLS		
A. LOAD BEARING	1 HOUR	1 HOUR
B. NON-LOAD BEARING	0 HOUR	0 HOUR
FIRE SEPARATION ASSEMBLIES		
A. EXIT ENCLOSURES	2 HOUR	2 HOUR
B. SHAFTS	2 HOUR (4 OR MORE STORY)	2 HOUR (4 OR MORE STORY)
C. MIXED USE SEPARATION	1 HOUR BETWEEN S-2 & B/M /S-1	1 HOUR BETWEEN S-2 & B/M
	1 HOUR BETWEEN A-2 & S-1	1 HOUR BETWEEN A-2 & S-1
	1 HOUR BETWEEN A-3 & B	1 HOUR BETWEEN A-3 & B
D. FIRE AREA SEPARATION		
SEPARATION BETWEEN UNITS	1 HOUR	1 HOUR
CORRIDOR SEPARATION	1 HOUR (BEARING)	1 HOUR (BEARING)
UNIT SEPARATION	1 HOUR	1 HOUR
CORRIDOR SEPARATION (R2)	0.5 HOUR	0.5 HOUR
FIRE PUMP ROOM IN A HIGH RISE HAS 2 HOUR RATING PER 913.2.1		
FIRE PARTITIONS		
EXIT ACCESS CORRIDORS		
USE GROUP: R	2 HOUR (BEARING)	2 HOUR (BEARING)
USE GROUP: A / B / M / S	2 HOUR	2 HOUR
OTHER NON-LOAD BEARING PARTITIONS	0 HOUR	0 HOUR
INTERIOR LOAD BEARING WALLS & PARTITIONS COLUMNS, BEAMS, TRUSSES, & FRAMING	1 HOUR	1 HOUR
STRUCTURAL MEMBERS SUPPORTING RATED WALLS	1 HOUR	1 HOUR
FLOOR CONSTRUCTION	1 HOUR	1 HOUR
ROOF CONSTRUCTION		
A. ALL ROOF CONSTRUCTION LESS THAN 20' AFF	1 HOUR	1 HOUR
B. PRIMARY ROOF CONSTRUCTION GREATER THAN 20' AFF (NOTE: IN M USE GROUP, 1 HOUR RATING REQUIRED ABOVE 20' AFF	0 HOUR	0 HOUR
C. SECONDARY ROOF CONSTRUCTION & DECK GREATER THAN 20' AFF	0 HOUR	0 HOUR
INTERIOR FINISHES		
A. VERTICAL EXITS & PASSAGEWAYS	A-3 / B / M: CLASS B R-S / S: CLASS C	
B. CORRIDORS / ENCLOSURE FOR EXIT ACCESS STAIRS / RAMPS	A-3 /B / M: CLASS B R-S / S: CLASS C	
C. ROOMS & ENCLOSED SPACES	A-3 /B / M /R-2 / S: CLASS C	
INTERIOR FINISHES TESTING CRITERIA		
A. WALLS & CEILINGS	ASTM E84	
B. FLOOR FINISHES	NFPA 253	
C. DECORATIONS & TRIM	NFPA 701	
MEANS OF EGRESS REQUIREMENTS		
A. MINIMUM HEAD ROOM	7'-6" MINIMUM HEIGHT, / 4" MAXIMUM PROJECTION BETWEEN 80"	
B. MAXIMUM TRAVEL DISTANCE	A, M, R, S-1: 250 FEET (SPRINKLED) B: 300 FEET SPRINKLED S-2: 400 FEET (SPRINKLED)	
C. DEAD END LIMIT (MBC 1020.4)	A: 20 FEET B, M, R, S: 50FEET (SPRINKLED)	
D. EGRESS CAPACITIES	MINIMUM WIDTH 44" SERVING AN OCCUPANT LOAD GREATER TH	
E. CAPACITIES PER UNIT WIDTH	BASED ON WIDTHS IN INCHES PER OCCUPANT	
1. STAIRS	.3" PER OCCUPANT	
2. DOORS	.2" PER OCCUPANT	
3. RAMPS	.2" PER OCCUPANT	
4. CORRIDORS	.2" PER OCCUPANT	
F. DOORS		
1. DOOR WIDTH	32" MINIMUM / 48" MAXIMUM	
2. DOOR PROJECTION	7" MAXIMUM INTO REQUIRED CORRIDOR WIDTH	
3. AUTOMATIC SELF-CLOSING DEVICES	ACTIVATED BY SMOKE DETECTION	
4. FIRE DOOR TESTING	IN ACCORDANCE WITH NFPA 80 & 252	
G. STAIRS		
1. MINIMUM WIDTH	44"	
2. MAXIMUM RISER	7"	
3. MINIMUM TREAD DEPTH	11"	
4. MINIMUM HEAD ROOM	6'-8", 7'-6" AT LANDINGS	
5. MAXIMUM HEIGHT BETWEEN LANDINGS	12'-0"	
6. HANDRAIL HEIGHT	34" - 38"	
7. GUARD HEIGHT	42" MINIMUM	
H. CORRIDORS		
1. MINIMUM WIDTH	44"	

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No. 1301031120
LICENSED ARCHITECT

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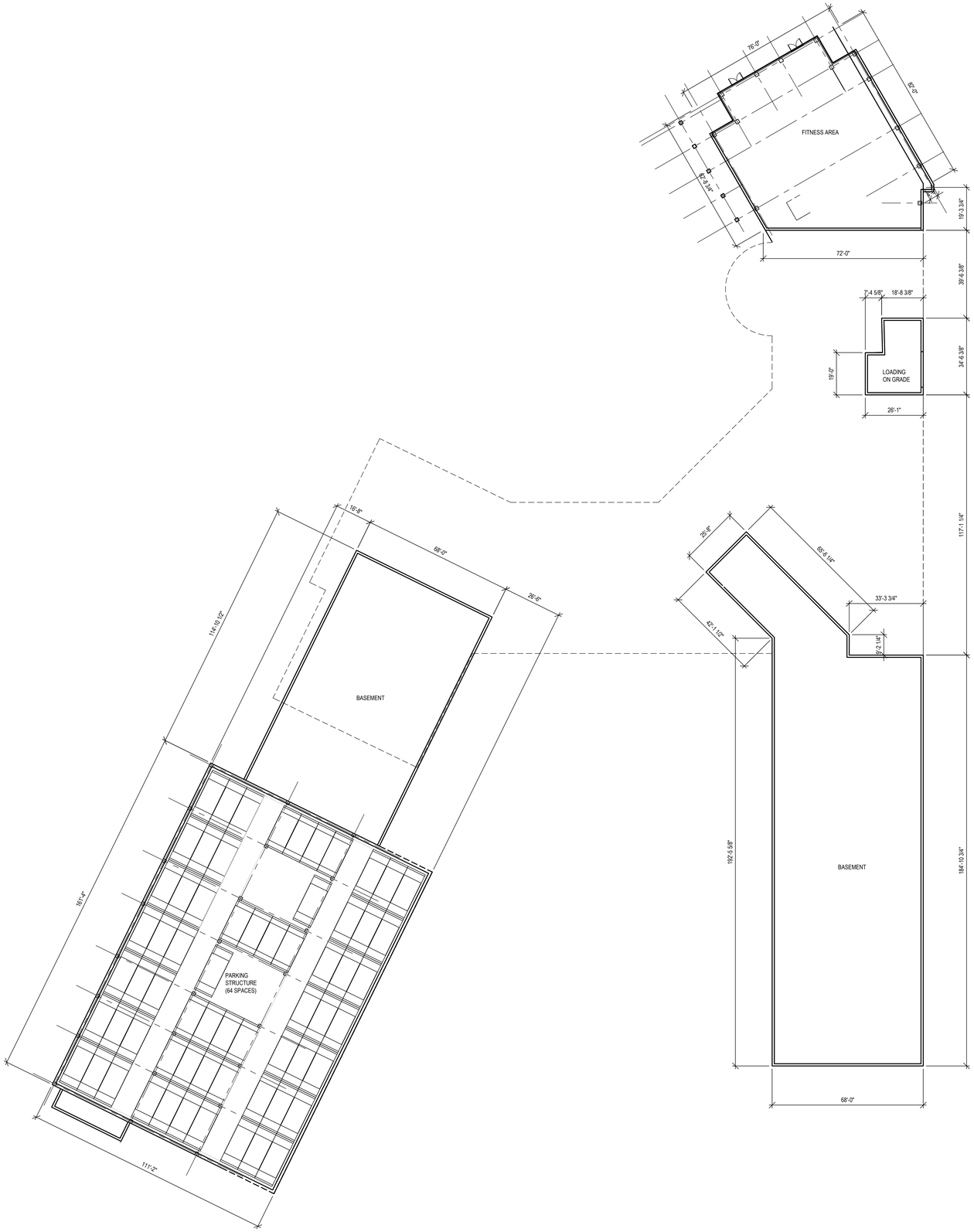
Title: **CODE COMPLIANCE**

Sheet: **AC103**



1 A100 BASEMENT FLOOR PLAN

SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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Title: **BASEMENT FLOOR PLAN**

Sheet: **A100**

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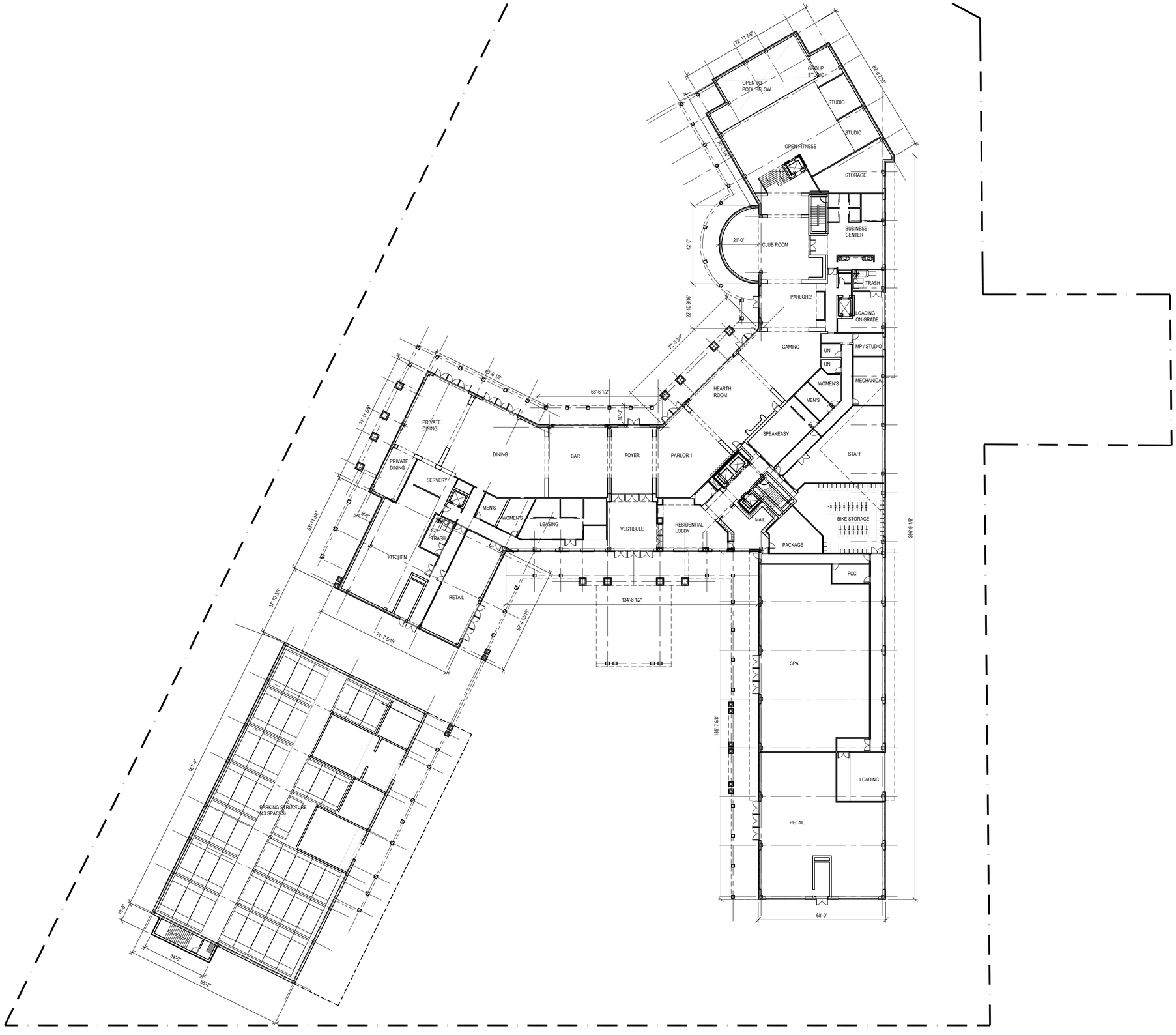

1 A101 GROUND FLOOR PLAN
SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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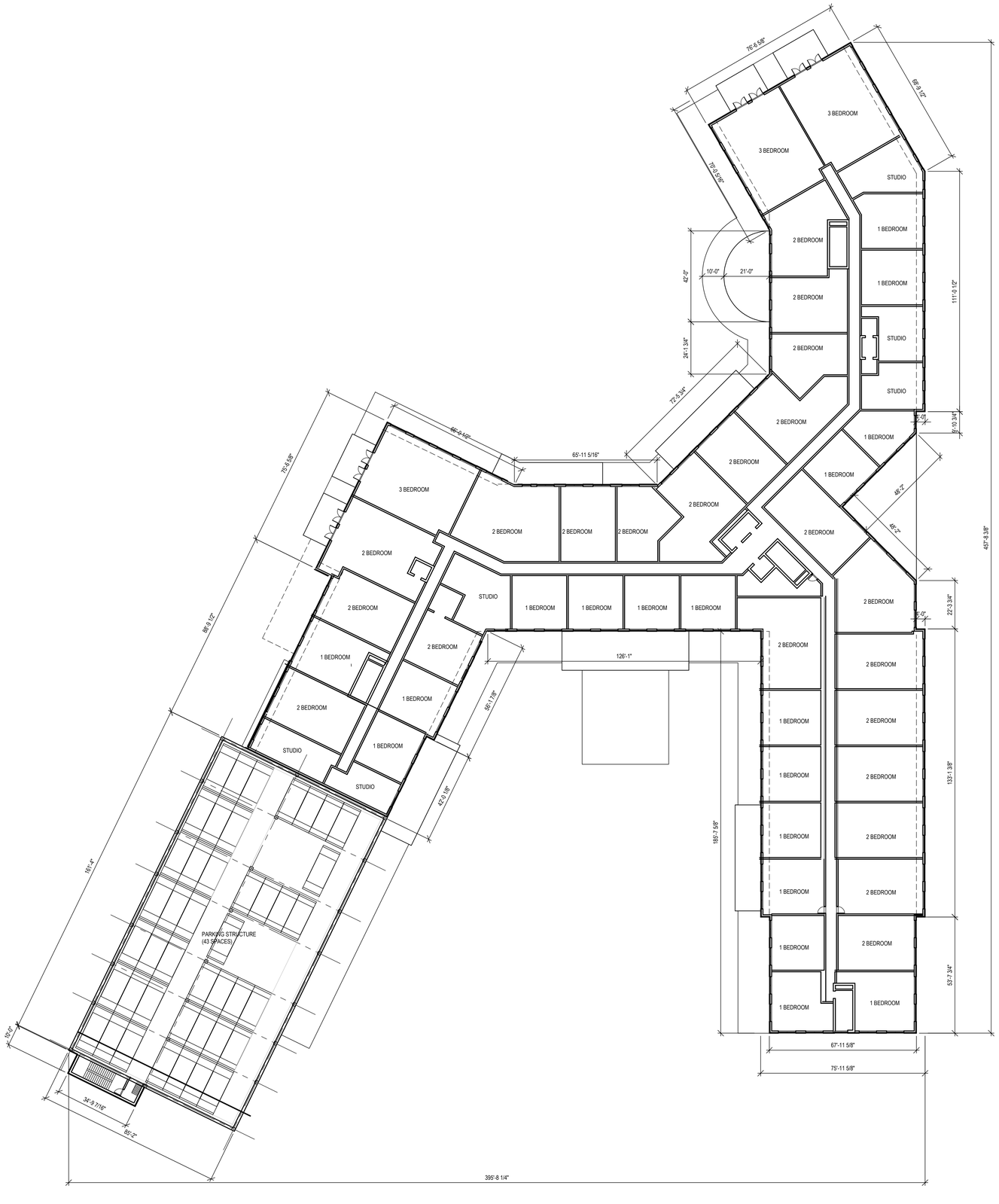
Title
GROUND FLOOR PLAN

Sheet
A101



1 / A102 SECOND FLOOR PLAN
SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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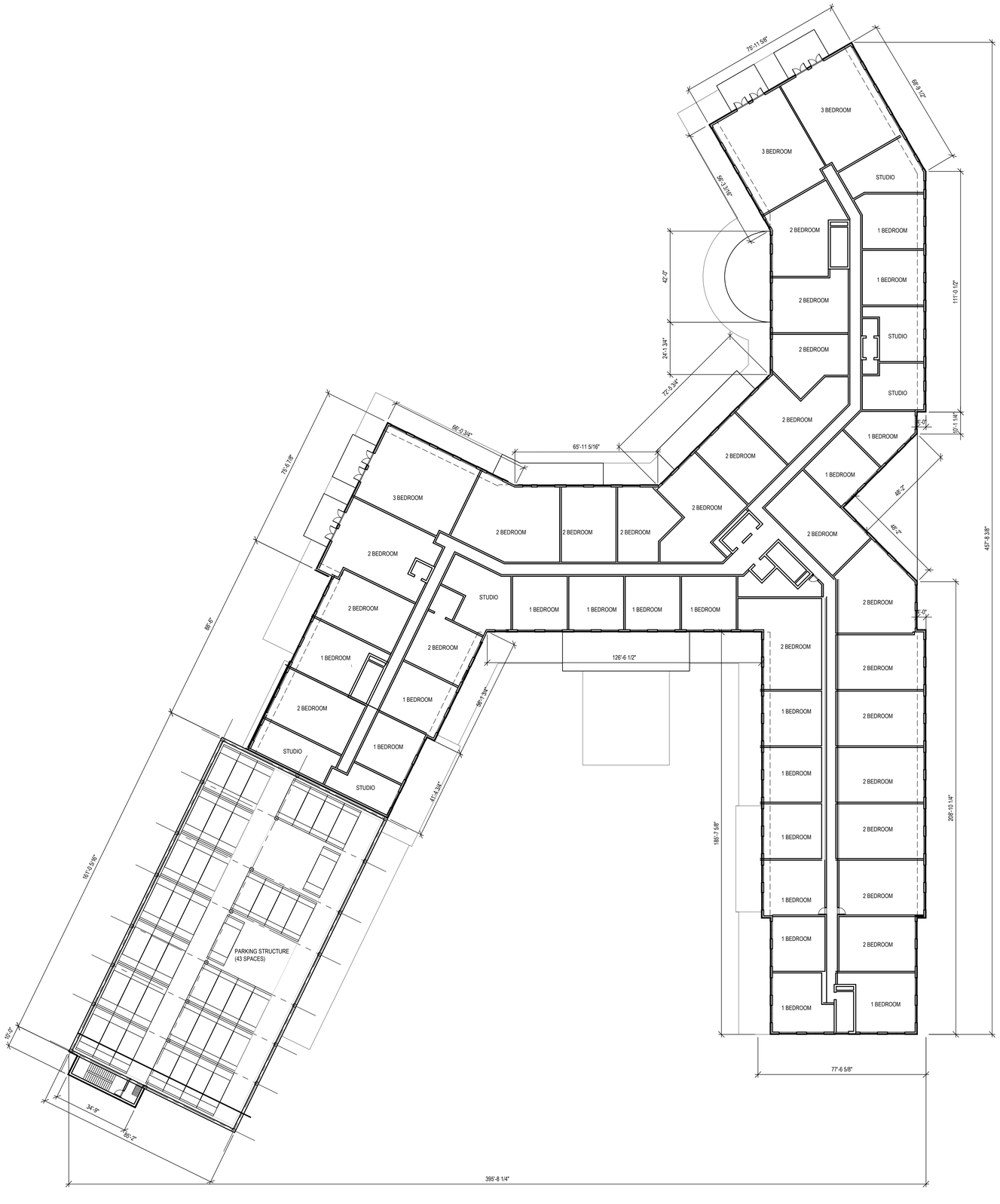
Title: **SECOND FLOOR PLAN**

Sheet: **A102**



1 / A103 THIRD FLOOR PLAN
SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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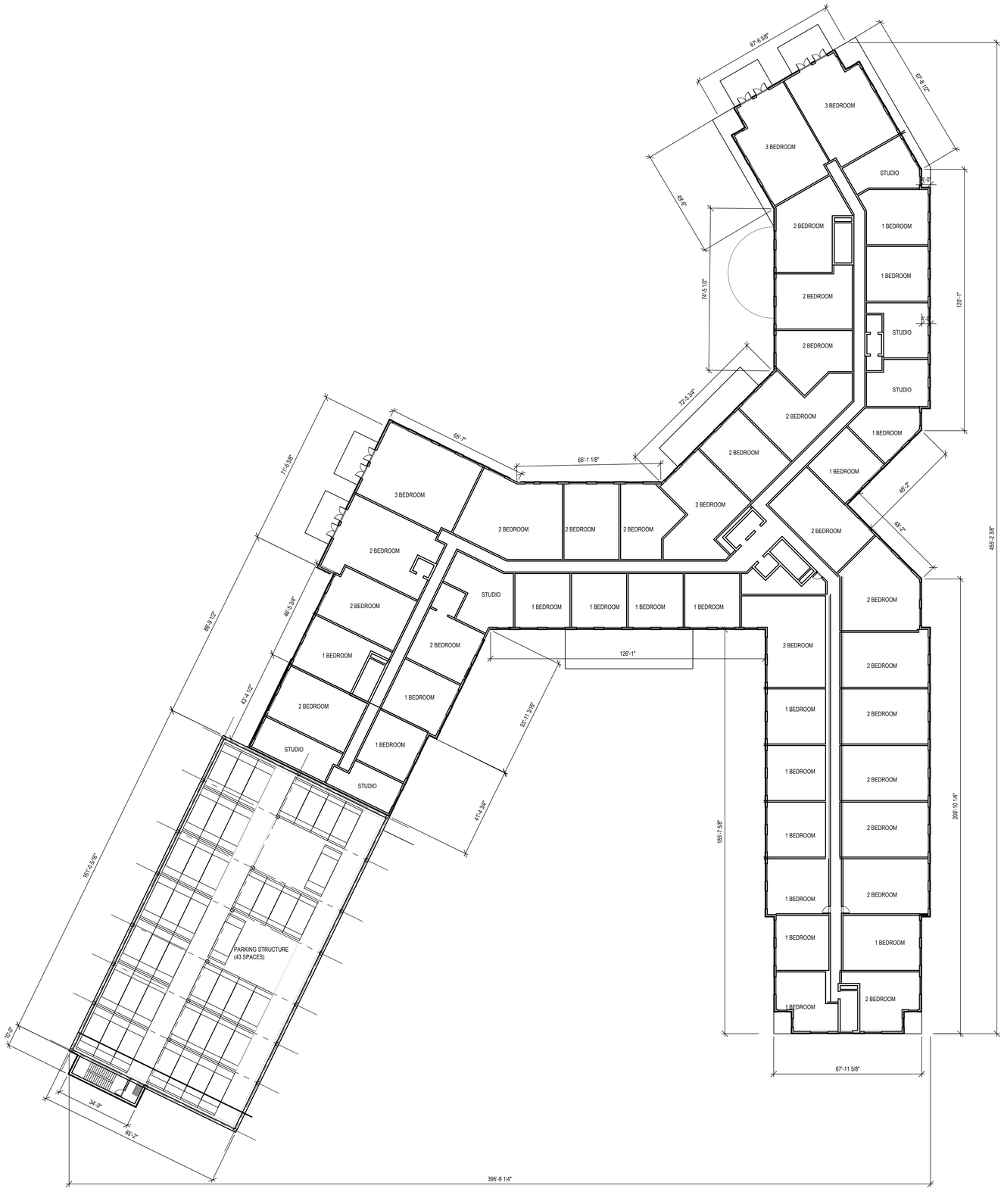
Title: **THIRD FLOOR PLAN**

Sheet: **A103**



1 / A104 FOURTH FLOOR PLAN
SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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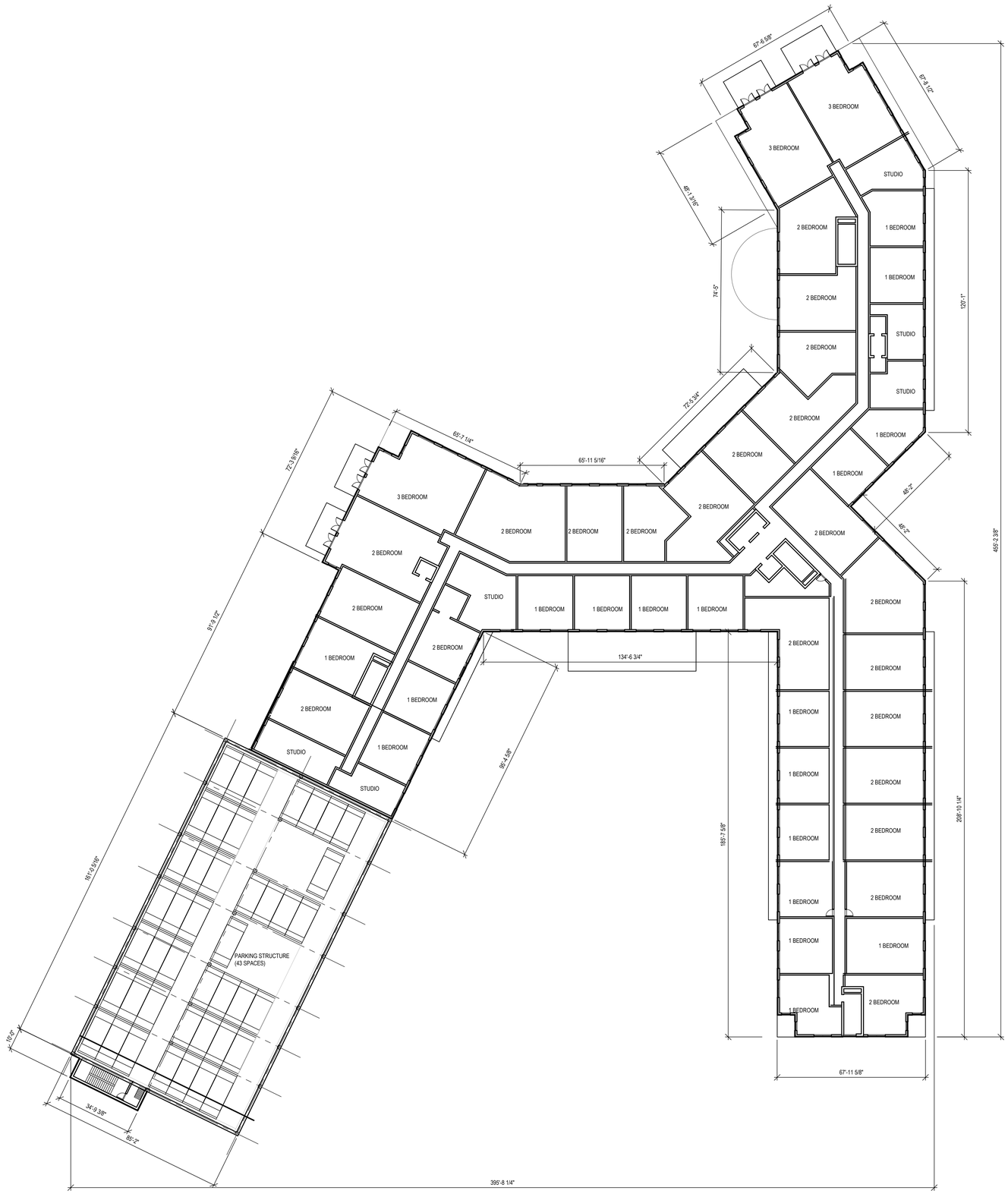
Title: **FOURTH FLOOR PLAN**

Sheet: **A104**



1 / A105 FIFTH FLOOR PLAN
SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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Title: **FIFTH FLOOR PLAN**

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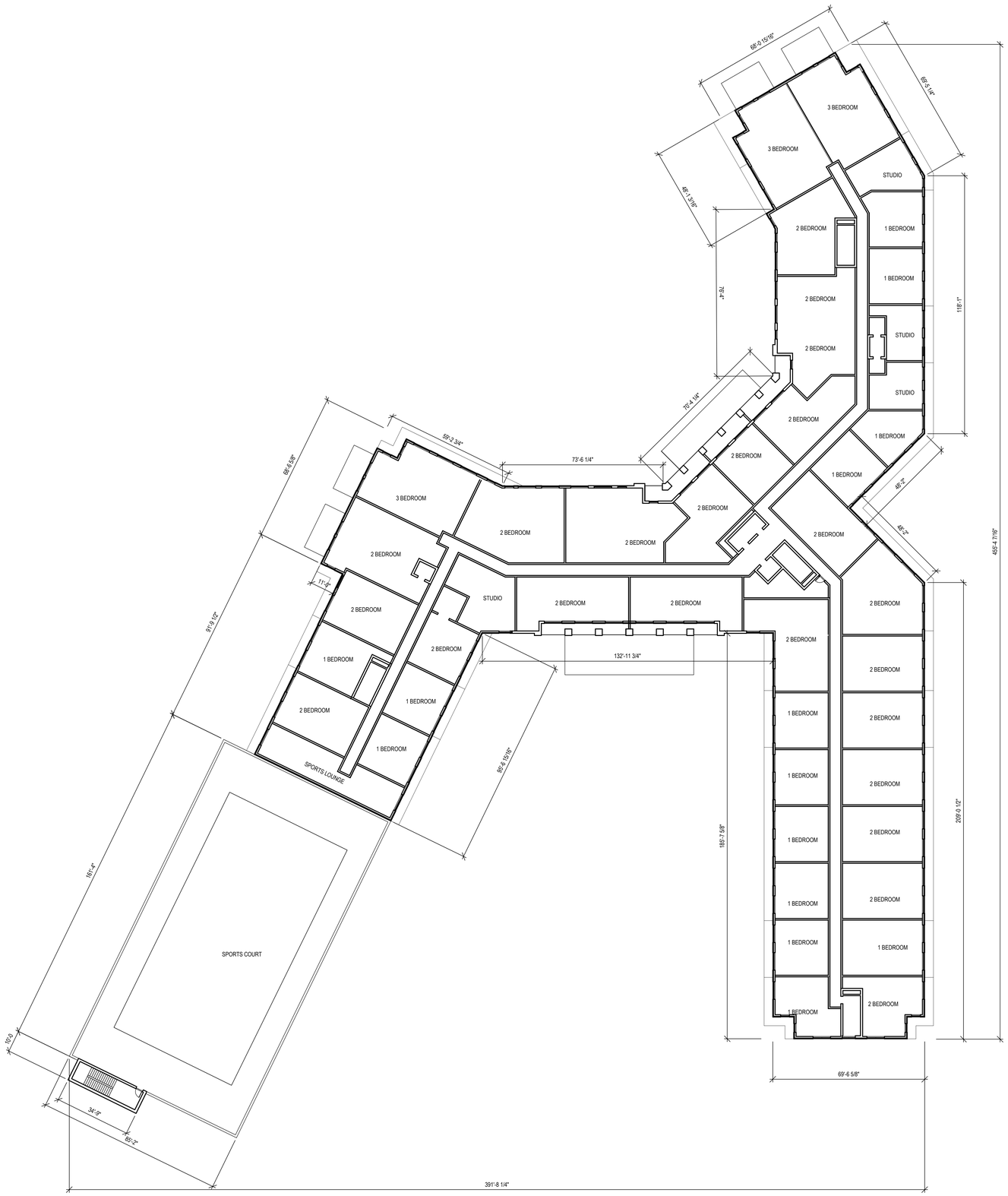
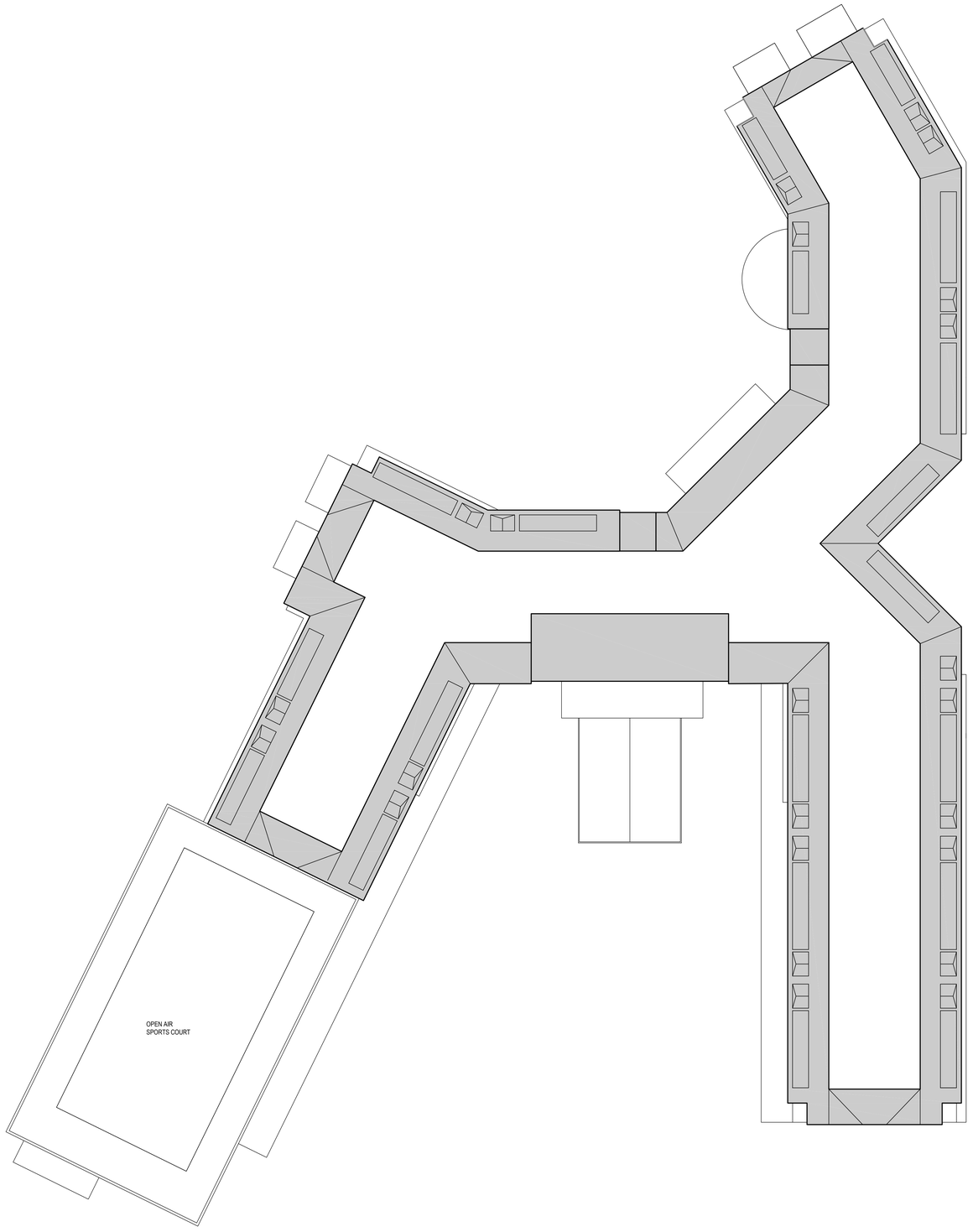

68'-0 15/16"
69'-5 1/4"
3 BEDROOM
3 BEDROOM
STUDIO
2 BEDROOM
1 BEDROOM
1 BEDROOM
2 BEDROOM
2 BEDROOM
STUDIO
STUDIO
2 BEDROOM
1 BEDROOM
1 BEDROOM
2 BEDROOM
2 BEDROOM
2



1 A107 ROOF PLAN
SCALE: 3/64" = 1'-0"

0'-0" 21'-4" 42'-8" 64'-0"

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Job Number: **2020142**

Title: **ROOF PLAN**

Sheet: **A107**

1 / 401 EAST ELEVATION
1/16" = 1'-0"

0'-0" 16'-0" 32'-0" 48'-0"

1 / 401 WEST ELEVATION
1/16" = 1'-0"

0'-0" 16'-0" 32'-0" 48'-0"

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☐ Record

Do not scale Use figured dimensions only

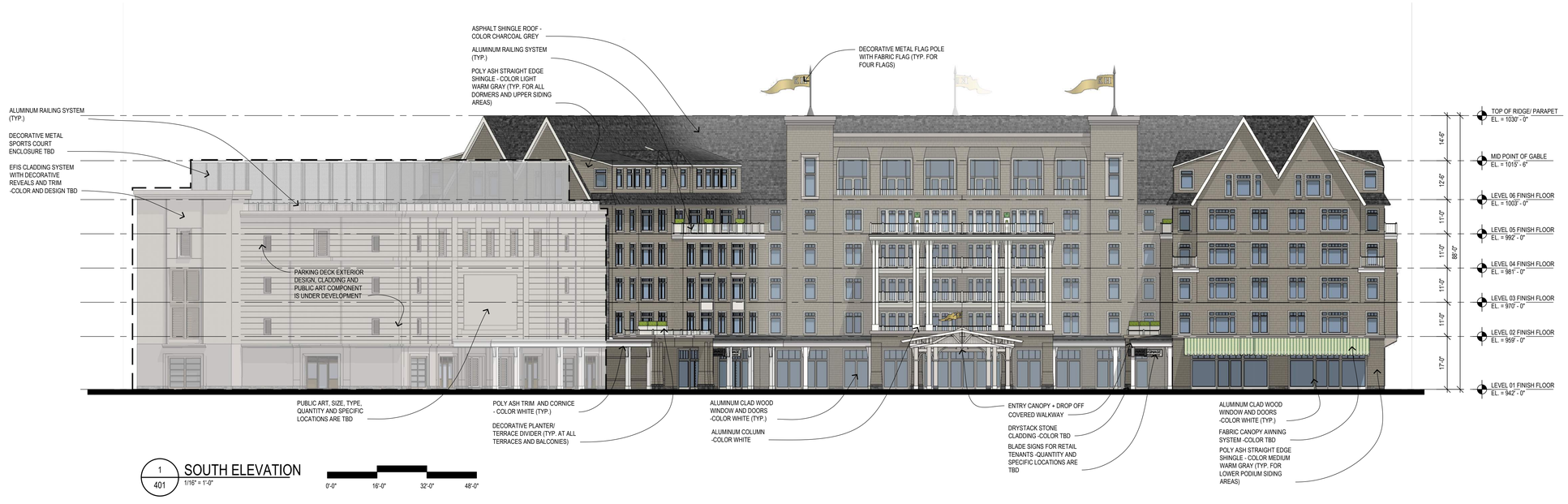
Job Number: **2020142**

Title: **Exterior Elevations**

Sheet: **A401**

1/401 NORTH ELEVATION
1/16" = 1'-0"

0'-0" 16'-0" 32'-0" 48'-0"



1/401 SOUTH ELEVATION
1/16" = 1'-0"

0'-0" 16'-0" 32'-0" 48'-0"

NEUMANN SMITH architecture

SOUTHFIELD • DETROIT

400 Galleria Officentre
Suite 555
Southfield, Michigan 48034
phone 248.352.8310
fax 248.352.1821
www.neumannsmith.com

RESIDENCE AT CASS LAKE
3170 Orchard Lake Road
Keego Harbor, MI 48320

TIR Equities
217 Pierce St. Suite 209
Birmingham, MI 48009

PRELIMINARY FOR DESIGN ONLY

Issued for

STATE OF MICHIGAN
JOEL LAWRENCE SMITH
ARCHITECT
No. 1301031120
LICENSED ARCHITECT

07.10.2023	Final Site Plan Review
02.09.2023	Preliminary Site Plan Review
02.06.2023	Page Turn
12.15.2022	Pre-application Conference

Drawn: MS
Checked: JN
Approved: JS
Bidpak Number: -

■ Preliminary
□ Construction
□ Record

Do not scale
Use figured dimensions only

Job Number: **2020142**

Title: **Exterior Elevations**

Sheet: **A402**

NORTH/ WATER VIEW

WEST VIEW

SOUTH/ ORCHARD LAKE ROAD VIEW

SOUTH/ ORCHARD LAKE ROAD VIEW

architecture
NEUMANN SMITH

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Checked: MS
Approved: JS
Bidpak Number: -

☑ Preliminary
☐ Construction
☐ Record

Do not scale
Use figured dimensions only

Job Number: 2020142

Title: EXTERIOR RENDERINGS

Sheet: A451

DESIGN *FORWARD*

RESIDENCES @ CASS LAKE

3170 Orchard Lake Rd, Keego Harbor, MI 48320

Final Plan Submission

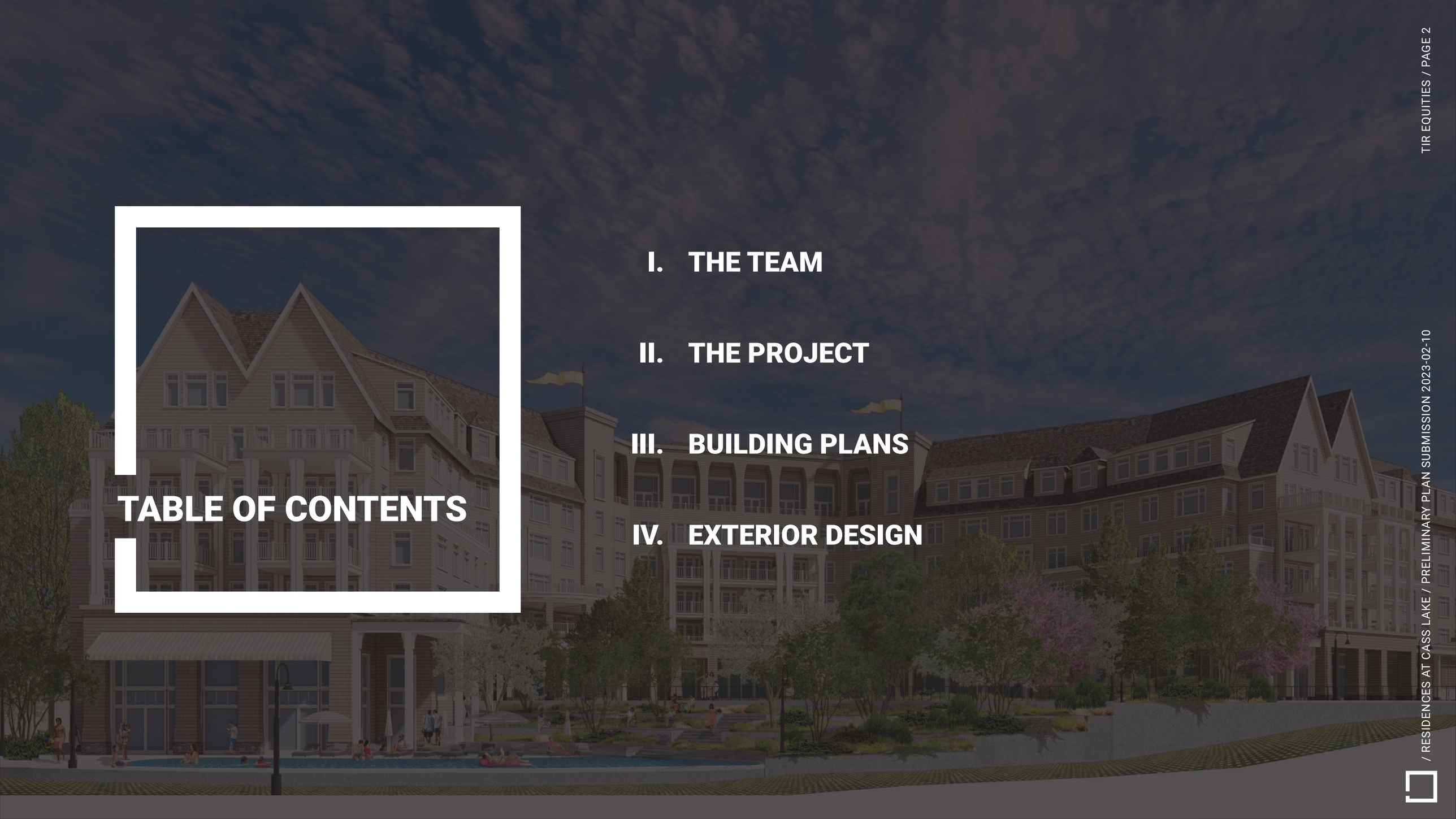


TABLE OF CONTENTS

I. THE TEAM

II. THE PROJECT

III. BUILDING PLANS

IV. EXTERIOR DESIGN

THE TEAM

TIR EQUITIES	**TIR Equities, LLC** Ara J. Darakjian	Developer
ROCKFORD CONSTRUCTION	**Rockford Construction** Mike Mraz, Kent Jackson, Matt Evans	Owner's Representative & Construction Manager
RAMSA	**Robert A.M. Stern Architects** Gemma Kim, Dan Lobitz	Design Architect
NEUMANN SMITH	**Neumann Smith Architecture** Joel Smith, Jaime Neher, Trent Schmitz	Architect of Record & Interior Design
OSD	**OSD Outside** Simon David	Landscape Architect
Gibbs Planning Group	**Gibbs Planning** Robert Gibbs	Urban Planning
IMEG	**IMEG** Jaynat Desai	Structural Engineering
MAENGINEERING	**MA Engineering** Salim Sessine	MEP Consultant
TEC TESTING ENGINEERS & CONSULTANTS, INC.	**Testing Engineers & Consultants** Salim Sessine	Geo-Technical Consultants
NF ENGINEERS	**Nowak & Fraus** Patrick Williams, Andrew Wiseman	Civil Engineering
RICH & ASSOCIATES PARKING CONSULTANTS	**Rich & Associates** David Rich	Parking Consultant
FLEIS&VANDENBRINK DESIGN. BUILD. OPERATE.	**Fleis & Vandenbrink**	Traffic Consultant

BARR	**BARR/ King & Macgregor** Jeff King	Environmental Consultant
ASSOCIATED ENVIRONMENTAL SYSTEMS	**Associated Environmental** Nicholas Maloof	Environmental Consultant
weitzman®	**Weitzman Real Estate Advisors** Peter Bazeli	Market Research & Planning
SME	**SME Engineering** Alex Kuisell	Engineering Consultant
FirstService RESIDENTIAL	**First Service Residential** Athenes Bauza, Calynne Oyolokor	Community Management & Operations
LIVunLtd	**LIVunLtd** Abbie Newman	Amenities Management & Planning
Colliers	**Colliers International** Paul Choukourian	Commercial Leasing
BERKADIA®	**Berkadia** Collin Callaghan	Financing Consultants
SK	**Seyburn Kahn** Alan Stillman	Legal Counsel
UHY LLP Certified Public Accountants	**UHY, LLP** Gordon Follmer, Ali Baydoun	Project Accountants
DASHER LAWLESS DESIGN CONSTRUCTION AUTOMATION	**DASHER LAWLESS** Shawn Adams	Automated Parking Consultant
		Branding & Marketing Consultants

II. THE PROJECT

PROJECT LOCATION

ZONING MAP

ZONING ANALYSIS SUMMARY
EXISTING ZONING
RMH - ONE FAMILY RESIDENTIAL DISTRICT

ZONING ORDINANCE REFERENCED:
Keego Harbor Zoning Ordinance

BUILDING SETBACKS
FRONT: 50'
SIDE, Least One: 10'
SIDE, Total Two: 20'
REAR: 10'

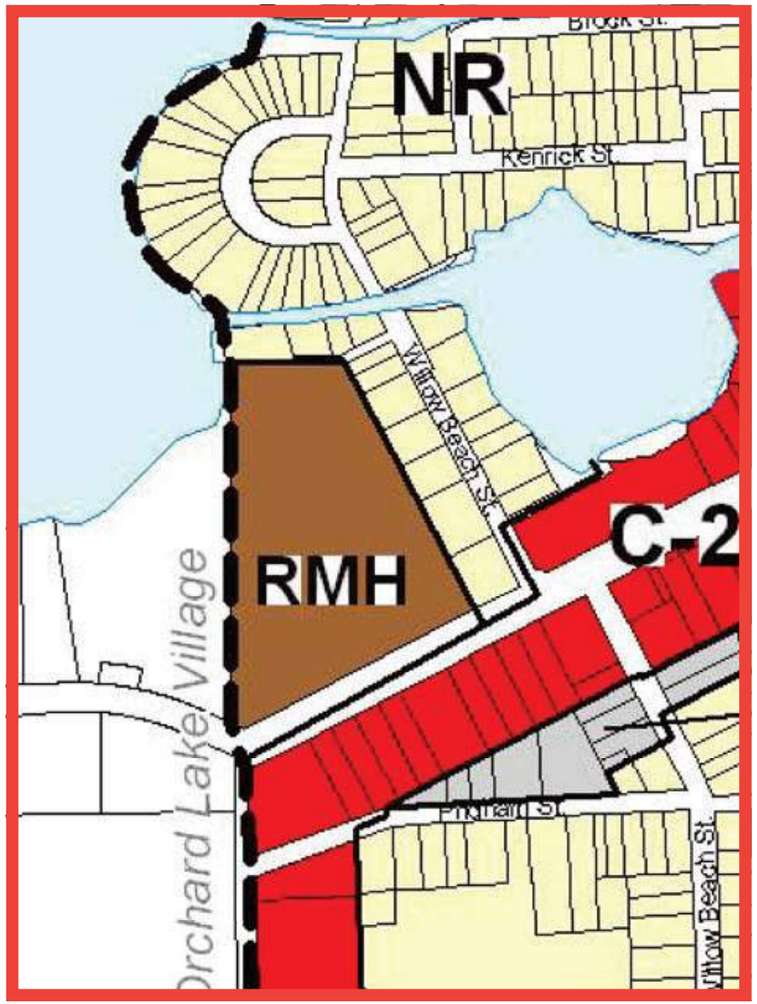
MAXIMUM BUILDING HEIGHT:
2 1/2 Stories or 35'

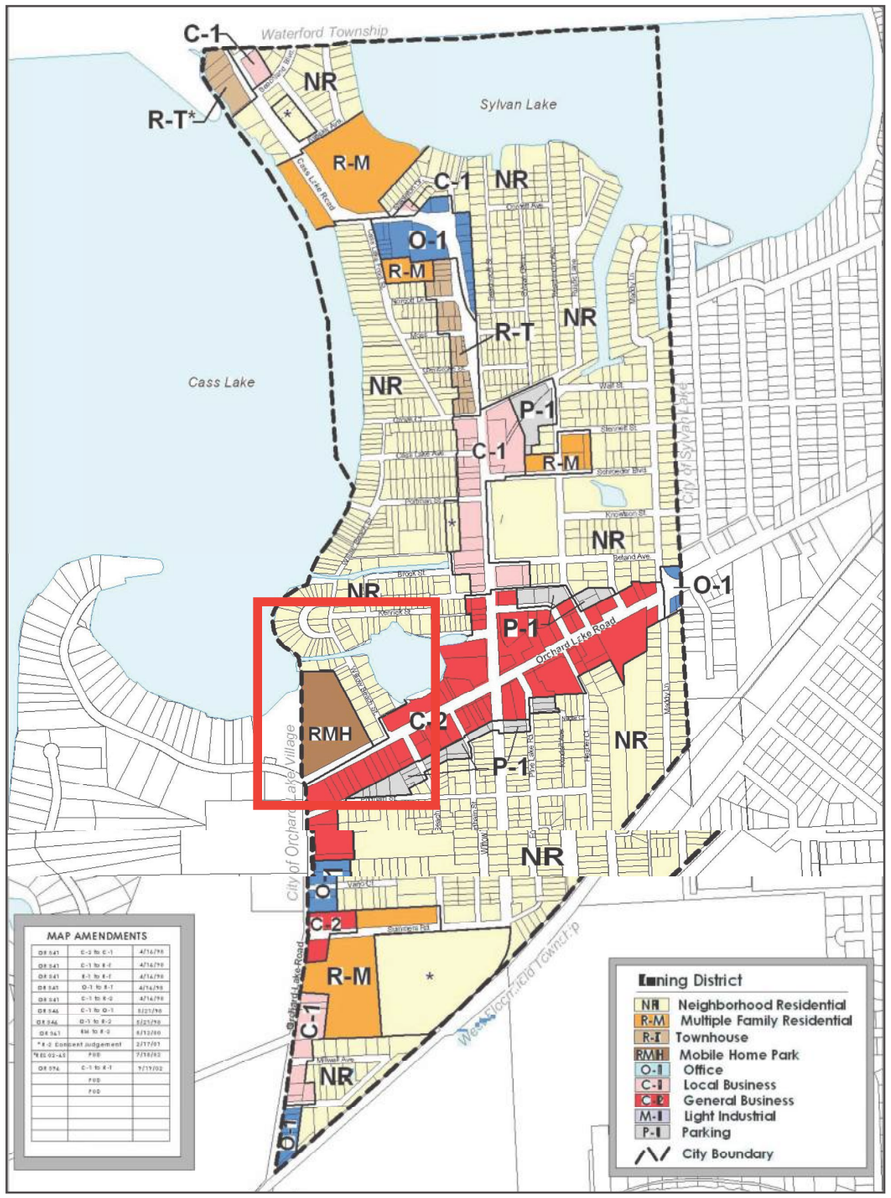
MINIMUM LOT AREA:
10 Acres

PROPOSED PROJECT USES:
Multiple Family Residential + General Business
(PLANNED UNIT DEVELOPMENT)

BUILDING SETBACKS
FRONT: 22'
EAST SIDE: 48'-6"
WEST SIDE: 45'-8"
REAR: 43'

BUILDING HEIGHT:
6 Stories / 73.5'TO MIDPOINT OF GABLE
88' TO TOP OF CENTER PARAPET/ RIDGE





THE VISION

The development offers residents and guests a lifestyle delivered on a silver platter. Combining next level hospitality with a unique lake culture that is accessible to all that come to experience.

The building starts as a formal, urban marketplace. As a guests enters the building it turns and rotates to point a persons perspective towards the lake to maximize the lakefront while changing and redirecting the users to unique points-of-view.

SERVICE
CULTURE
LUXURY
DETROIT
ACCESSIBLE
LAKE
ART
ALIVE
ANIMATE
ENTERTAIN

III. BUILDING PLANS

SITE PLAN

- BUILDING FOOTPRINT
- PROPERTY LINE
- CASS LAKE
- GREEN SPACE
- HARDSCAPE
- AMENITY SPACE

PARKING TABULATIONS

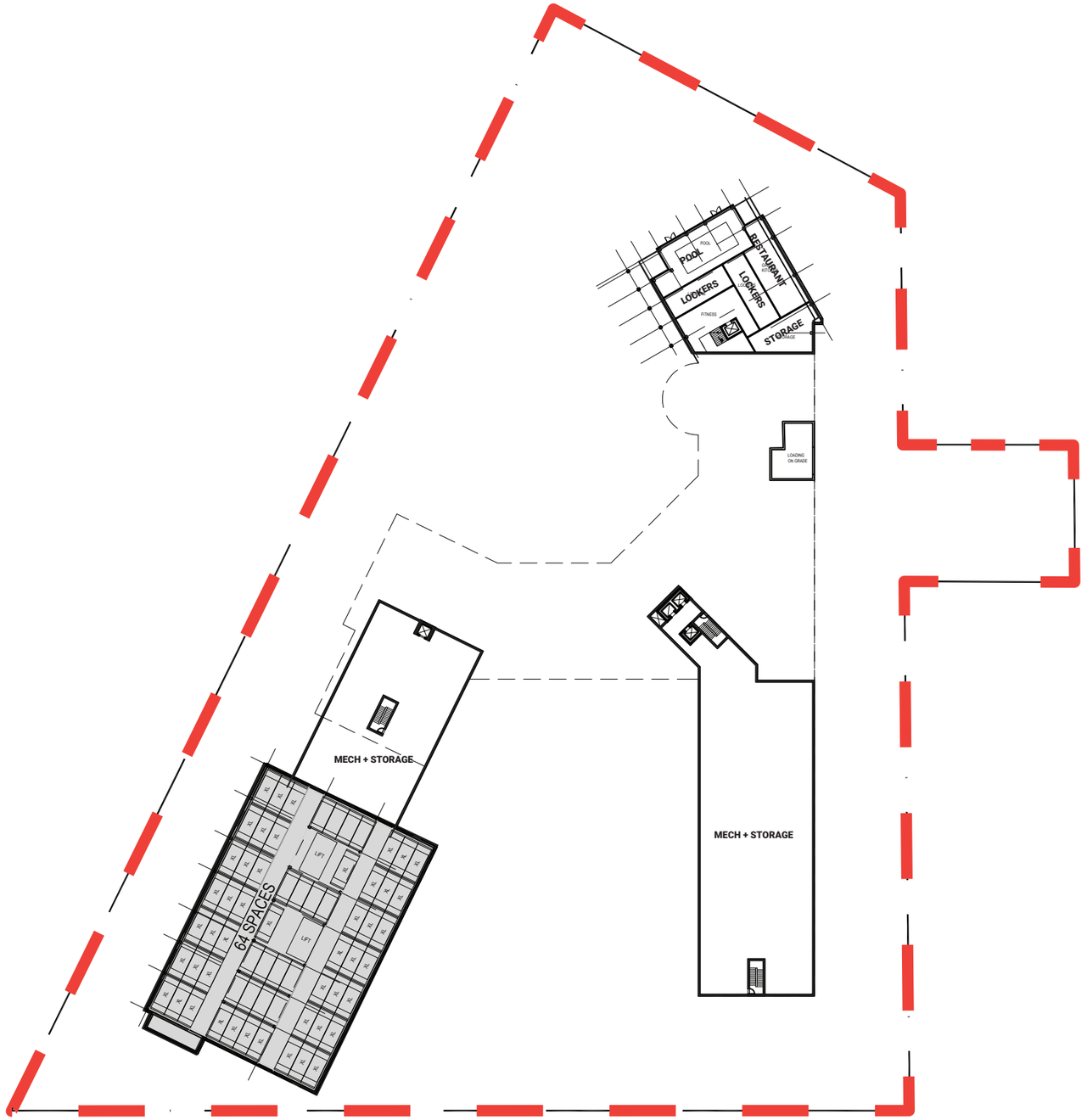
ONSITE PARKING	55
TOTAL STRUCTURE	384
TOTAL SITE PARKING	**439**

PARKING STRUCTURE NOTES:
- SIX 'LEVELS' ABOVE GRADE
- TWO 'LEVELS' BELOW GRADE

SCALE: 1" = 80'-0"

LEVEL 00 - FLOOR PLAN

- BUILDING FOOTPRINT
- PROPERTY LINE
- RESIDENTIAL LEVELS
- PARKING GARAGE



SCALE: 1” = 80’-0”

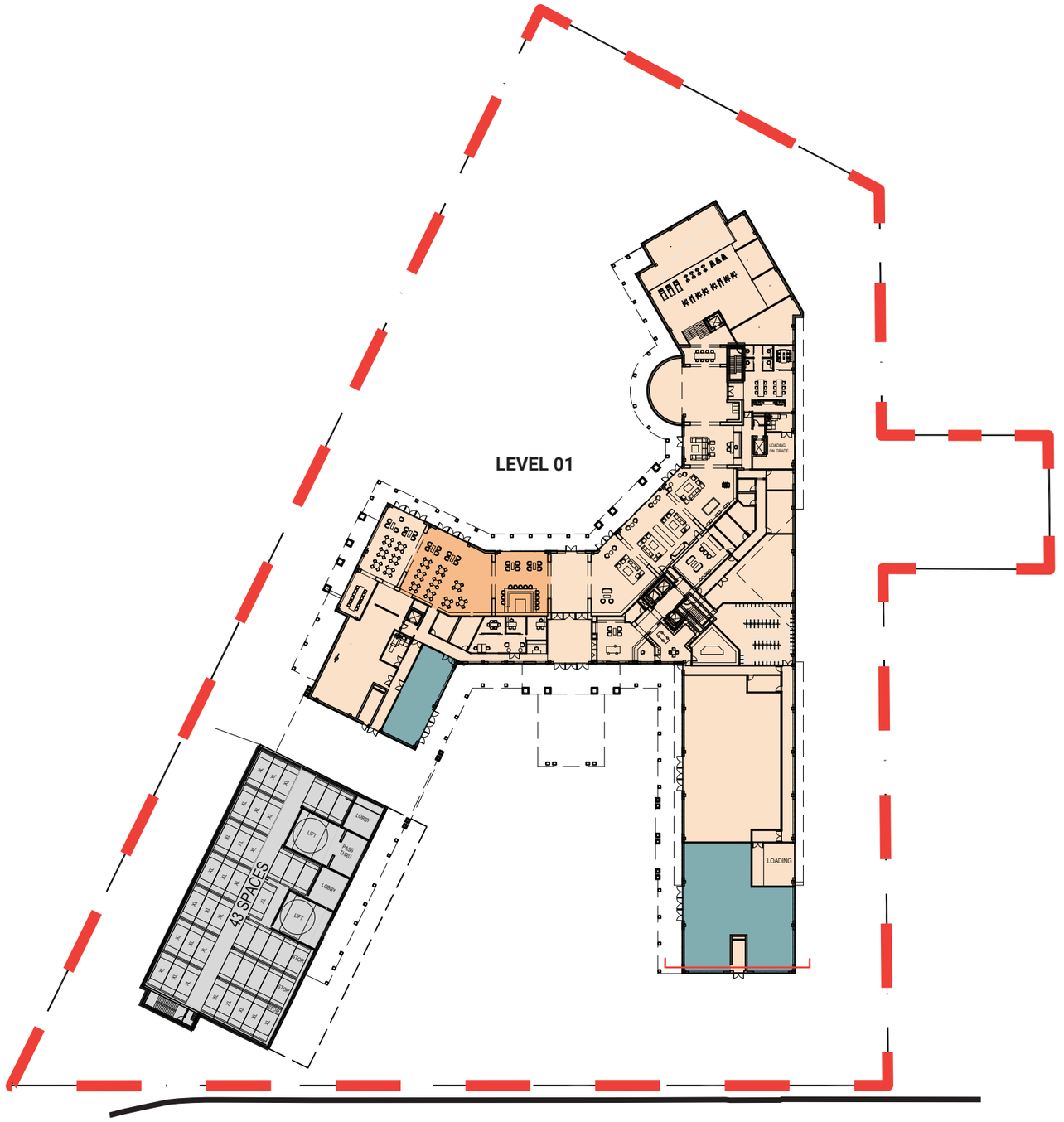
LEVEL 01 - FLOOR PLAN

- BUILDING FOOTPRINT
- PROPERTY LINE
- RESIDENTIAL LEVELS
- PARKING GARAGE
- RETAIL SPACE
- FOOD + BEVERAGE SPACE
- RESIDENT AMENITY/ SERVICE SPACE

SQUARE FOOTAGE TABULATIONS (GSF)

FOOD + BEVERAGE	3,558
RETAIL	6,066
RESIDENCE ONLY	41,667
TOTAL SQUARE FOOTAGE (GSF)	**51,291**

SCALE: 1” = 80’-0”



LEVEL 2 - FLOOR PLAN

BUILDING FOOTPRINT

PROPERTY LINE

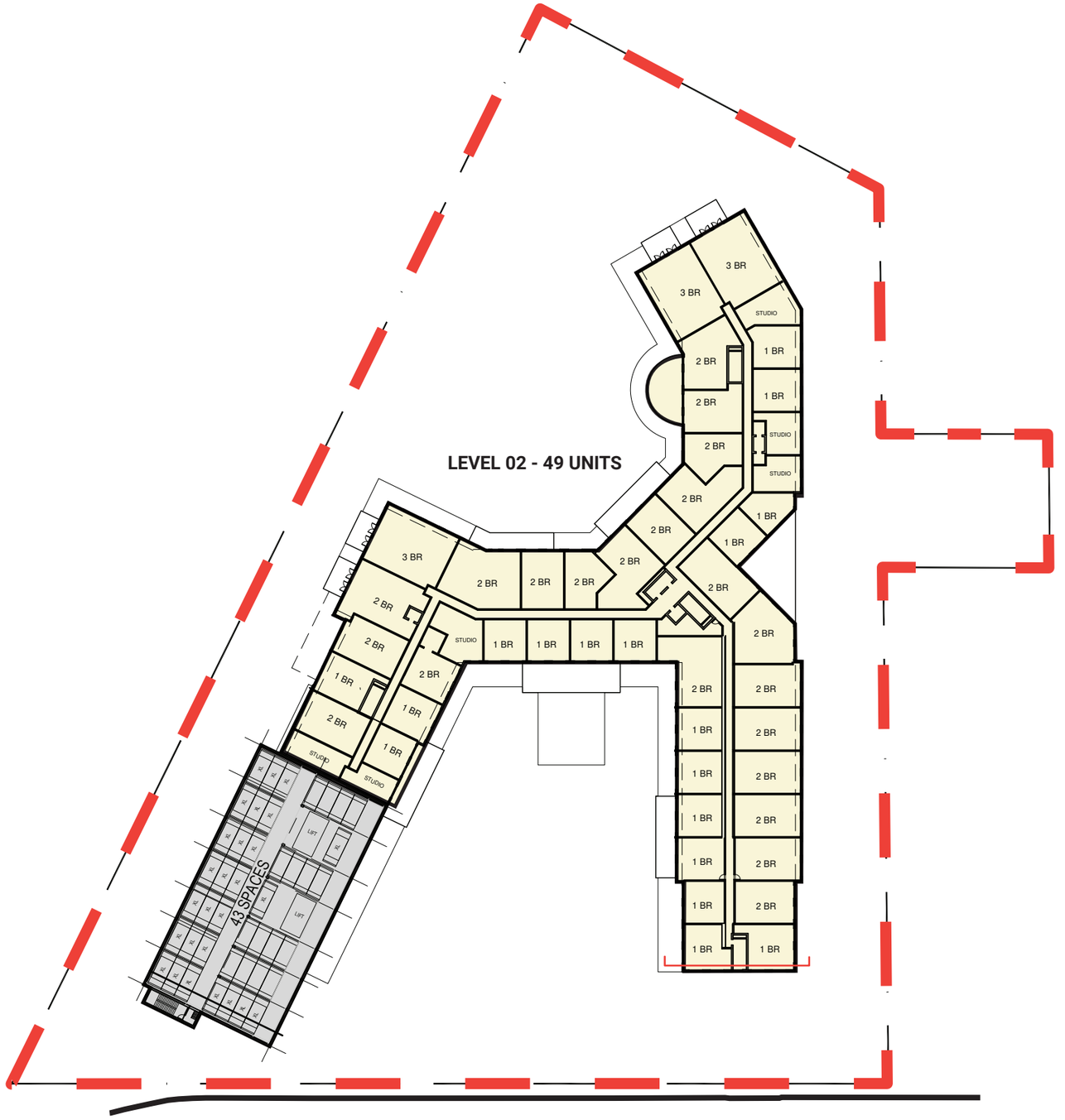
RESIDENTIAL LEVELS

PARKING GARAGE

UNIT TABULATIONS

LEVEL 01	0
LEVEL 02	49
LEVEL 03	49
LEVEL 04	49
LEVEL 05	49
LEVEL 06	42
TOTAL UNIT COUNT	**238**

SCALE: 1” = 80’-0”



LEVEL 3 - FLOOR PLAN

BUILDING FOOTPRINT

PROPERTY LINE

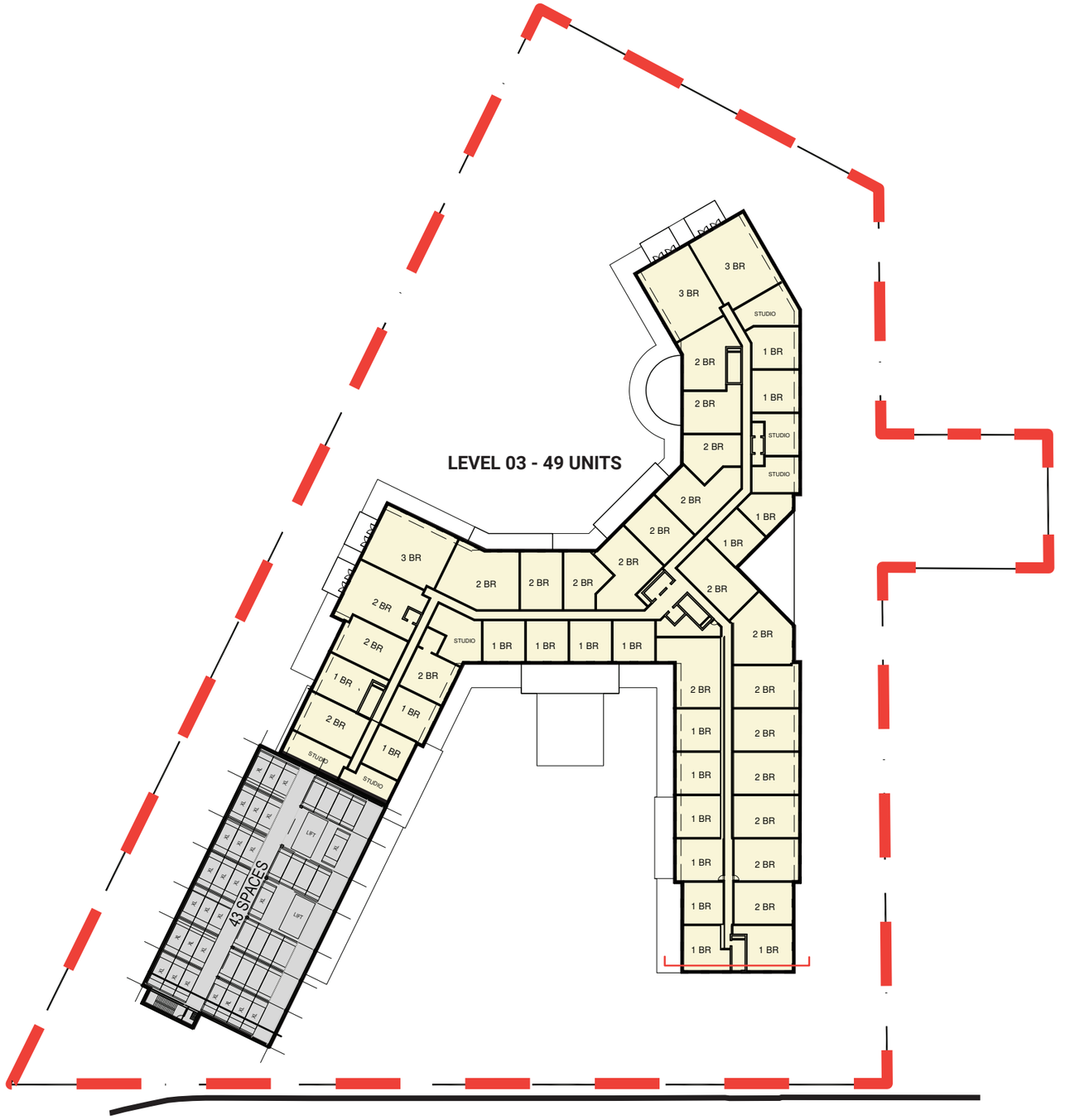
RESIDENTIAL LEVELS

PARKING GARAGE

UNIT TABULATIONS

LEVEL 01	0
LEVEL 02	49
LEVEL 03	49
LEVEL 04	49
LEVEL 05	49
LEVEL 06	42
TOTAL UNIT COUNT	**238**

SCALE: 1” = 80’-0”



LEVEL 4 - FLOOR PLAN

BUILDING FOOTPRINT

PROPERTY LINE

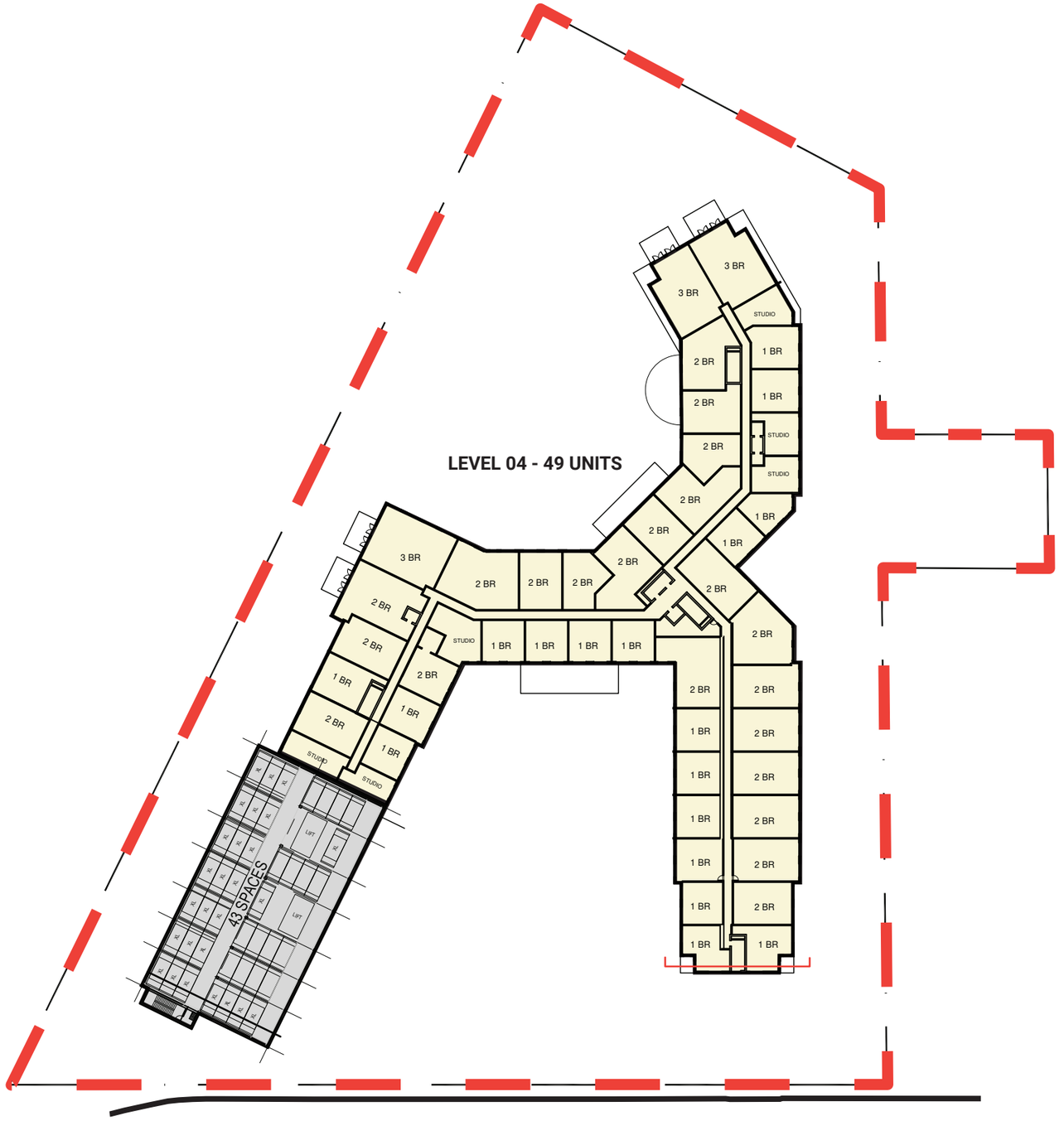
RESIDENTIAL LEVELS

PARKING GARAGE

UNIT TABULATIONS

LEVEL 01	0
LEVEL 02	49
LEVEL 03	49
LEVEL 04	49
LEVEL 05	49
LEVEL 06	42
TOTAL UNIT COUNT	**238**

SCALE: 1” = 80’-0”



LEVEL 5 - FLOOR PLAN

BUILDING FOOTPRINT

PROPERTY LINE

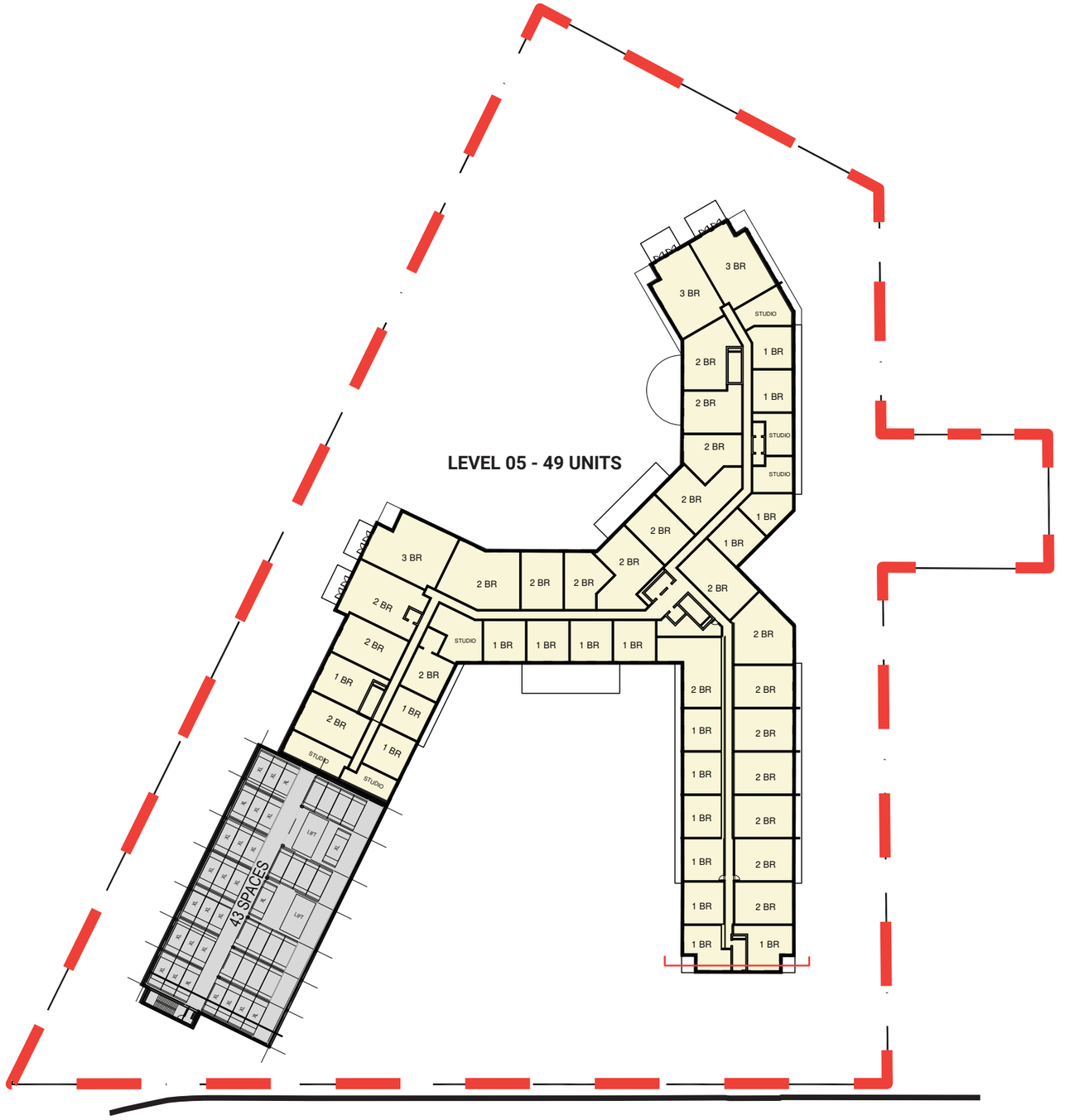
RESIDENTIAL LEVELS

PARKING GARAGE

UNIT TABULATIONS

LEVEL 01	0
LEVEL 02	49
LEVEL 03	49
LEVEL 04	49
LEVEL 05	49
LEVEL 06	42
TOTAL UNIT COUNT	**238**

SCALE: 1” = 80’-0”



LEVEL 6 - FLOOR PLAN

BUILDING FOOTPRINT

PROPERTY LINE

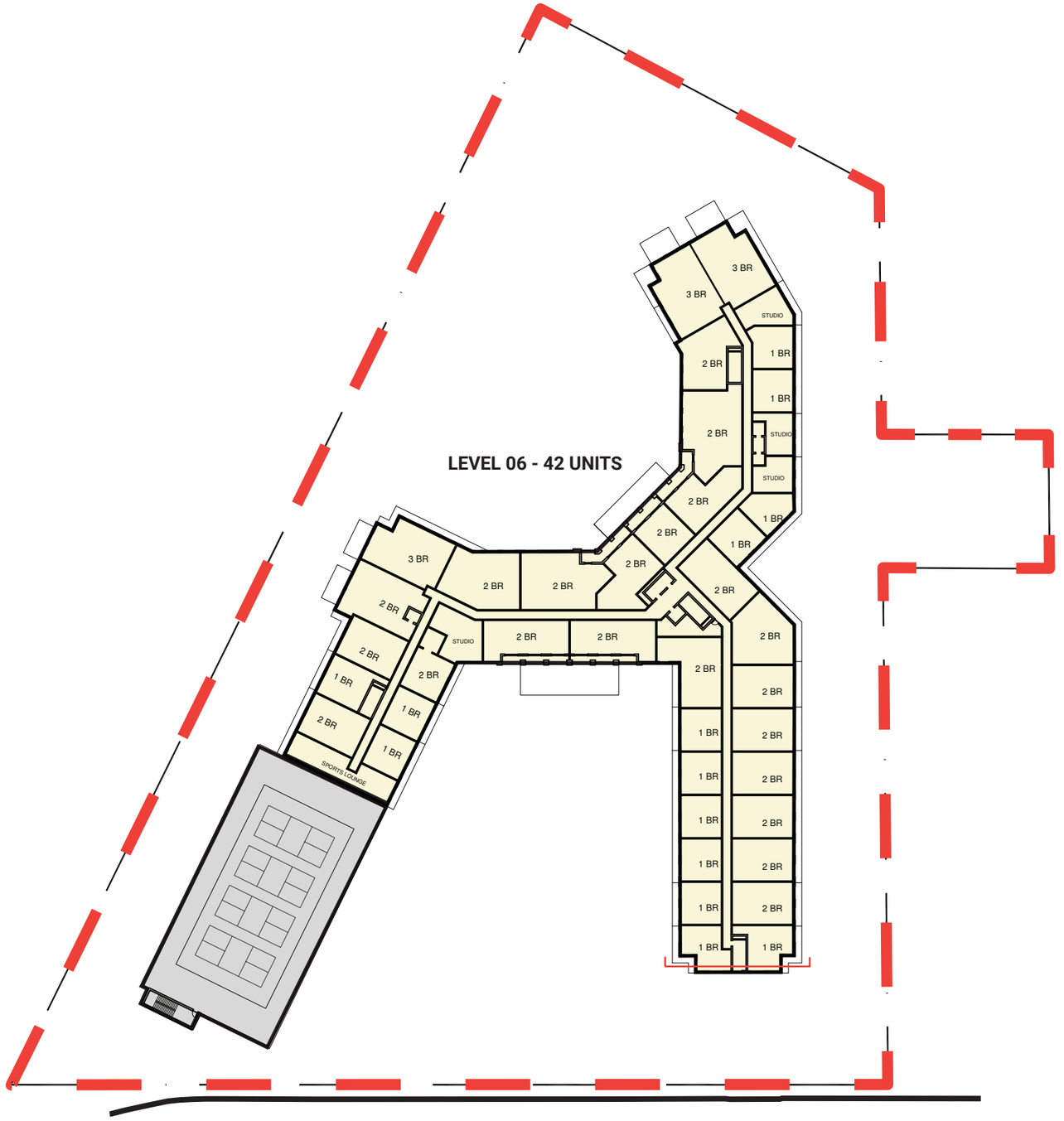
RESIDENTIAL LEVELS

PARKING GARAGE

UNIT TABULATIONS

LEVEL 01	0
LEVEL 02	49
LEVEL 03	49
LEVEL 04	49
LEVEL 05	49
LEVEL 06	42
TOTAL UNIT COUNT	**238**

SCALE: 1” = 80’-0”

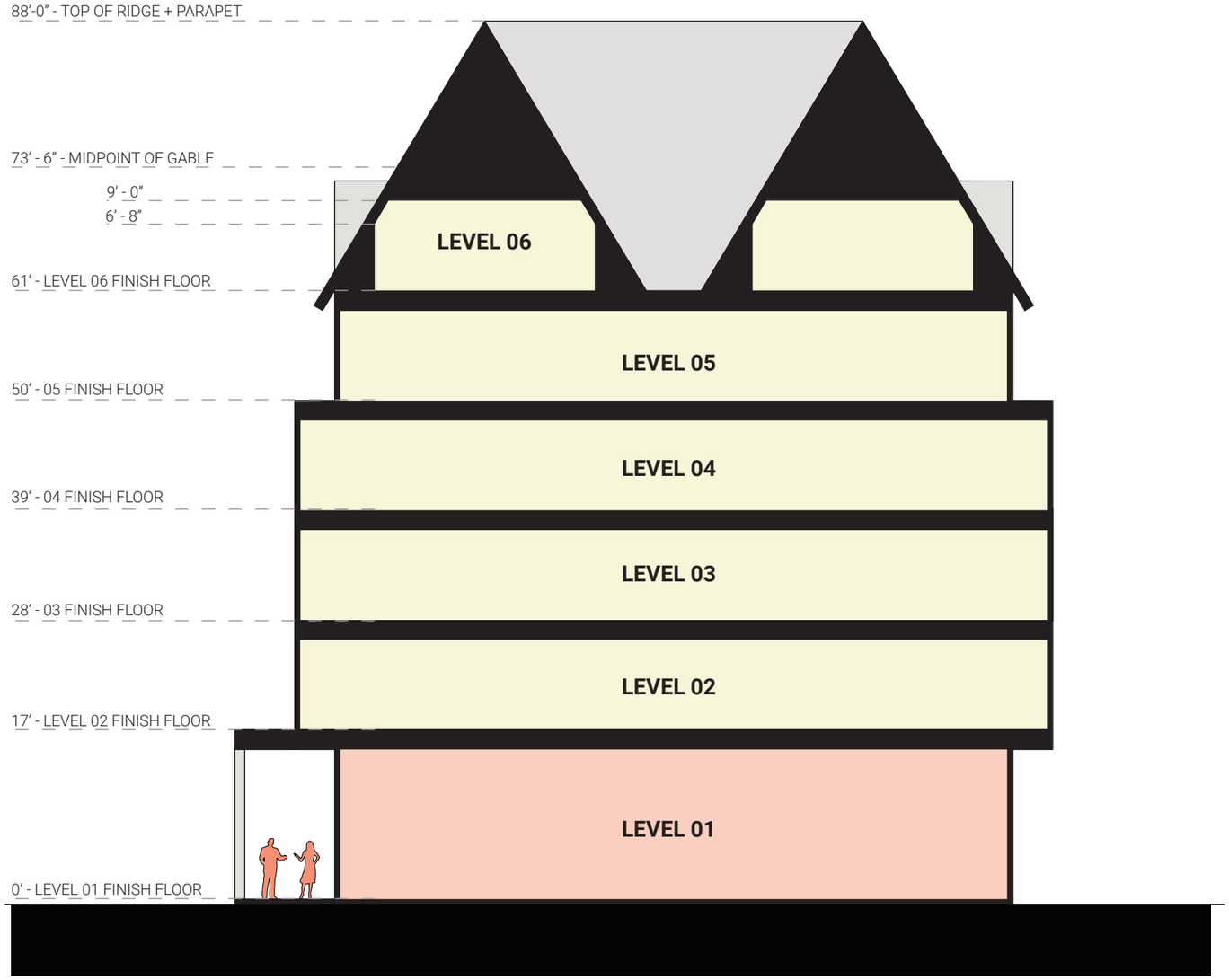


UNIT TABULATIONS

NEUMANN / SMITH TABULATIONS					
LEVEL	**UNIT TYPE** (AVERAGE SF)				**TOTAL**
	STUDIO (600 SF)	**1 BEDROOM** (680 SF)	**2 BEDROOM** (975 SF)	**3 BEDROOM** (1585 SF)	
GROUND	0	0	0	0	0
2ND LEVEL	6	18	22	3	49
3RD LEVEL	6	18	22	3	49
4TH LEVEL	6	18	22	3	49
5TH LEVEL	6	18	22	3	49
6TH LEVEL	4	13	22	3	42
TOTAL	**28**	**85**	**110**	**15**	**238**

PERCENTAGES	**12%**	**36%**	**46%**	**6%**	**100%**

BUILDING SECTION



SCALE: 1/16" = 1'-0"

0' 16' 32' 48'

IV. EXTERIOR DESIGN

LANDSCAPE MATERIALITY

NATURAL WOOD FENCE

BEACH SAND

WOOD DECKING

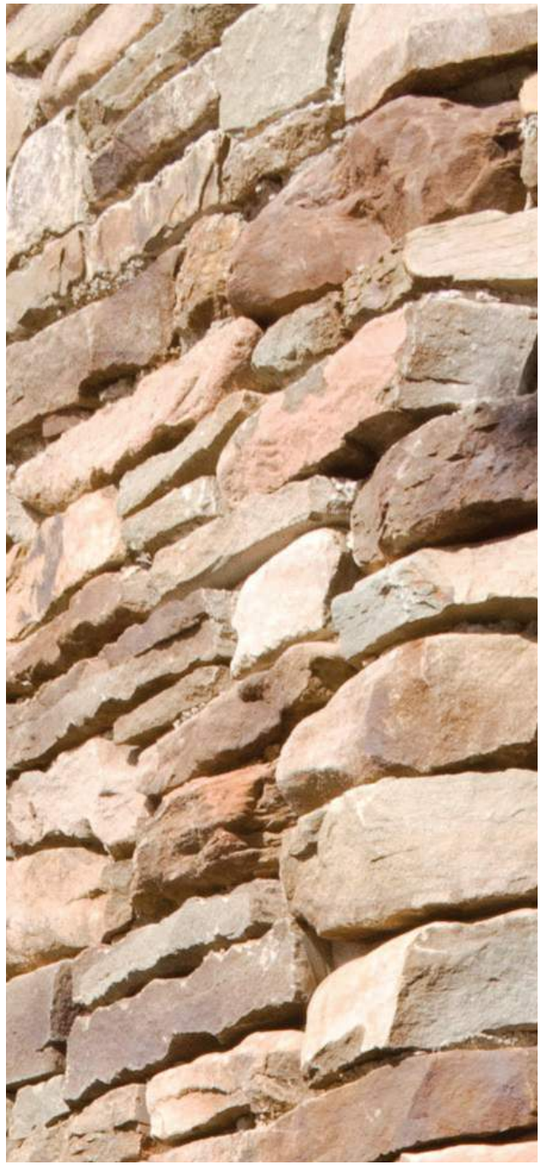
EXPOSED AGGREGATE CONCRETE

AIR PAVE SYSTEM

COBBLESTONE PAVERS

STONE PAVING

BUILDING MATERIALITY



DRY STACKED STONE - COLOR TBD

POLY ASH SHINGLES

UPPER SHINGLE - COLOR LIGHT WARM GRAY

ASPHALT SHINGLE ROOF - COLOR CHARCOAL GRAY

PODIUM SHINGLE - COLOR MEDIUM WARM GRAY

POLY ASH TRIM - COLOR WHITE

PARTIAL ELEVATION

- ASPHALT SHINGLE ROOF - COLOR CHARCOAL GRAY
- DORMER UPPER SHINGLE - POLY ASH SHINGLE COLOR LIGHT WARM GRAY
- RAILING ALUMINUM COLOR WHITE
- COLUMN ALUMINUM COLOR WHITE
- TRIM POLY ASH COLOR WHITE
- WINDOW ALUMINUM CLAD WOOD COLOR WHITE
- UPPER SHINGLE - POLY ASH SHINGLE COLOR LIGHT WARM GRAY
- FABRIC CANOPY COLOR TBD
- COLUMN ALUMINUM CLAD COLOR WHITE
- WINDOW & DOOR ALUMINUM CLAD COLOR WHITE
- PODIUM SHINGLE - POLY ASH SHINGLE COLOR MEDIUM WARM GRAY
- DRY STACKED STONE COLOR TBD

WATER VIEW

WATER VIEW

ORCHARD LAKE VIEW

WEST VIEW

NOTE: PARKING DECK EXTERIOR DESIGN, CLADDING AND PUBLIC ART COMPONENT IS UNDER DEVELOPMENT

ORCHARD LAKE VIEW

NOTE: PARKING DECK EXTERIOR DESIGN, CLADDING AND PUBLIC ART COMPONENT IS UNDER DEVELOPMENT

SHADOW STUDY - WINTER SOLSTICE

WINTER SOLSTICE - 9:00 AM

WINTER SOLSTICE - 12:00 PM

WINTER SOLSTICE - 3:00 PM

SHADOW STUDY - SUMMER SOLSTICE

SUMMER SOLSTICE - 9:00 AM

SUMMER SOLSTICE - 12:00 PM

SUMMER SOLSTICE - 5:00 PM

SHADOW STUDY - AUTUMNAL EQUINOX

AUTUMNAL EQUINOX - 9:00 AM

AUTUMNAL EQUINOX - 12:00 PM

AUTUMNAL EQUINOX - 4:00 PM

SHADOW STUDY - VERNAL EQUINOX

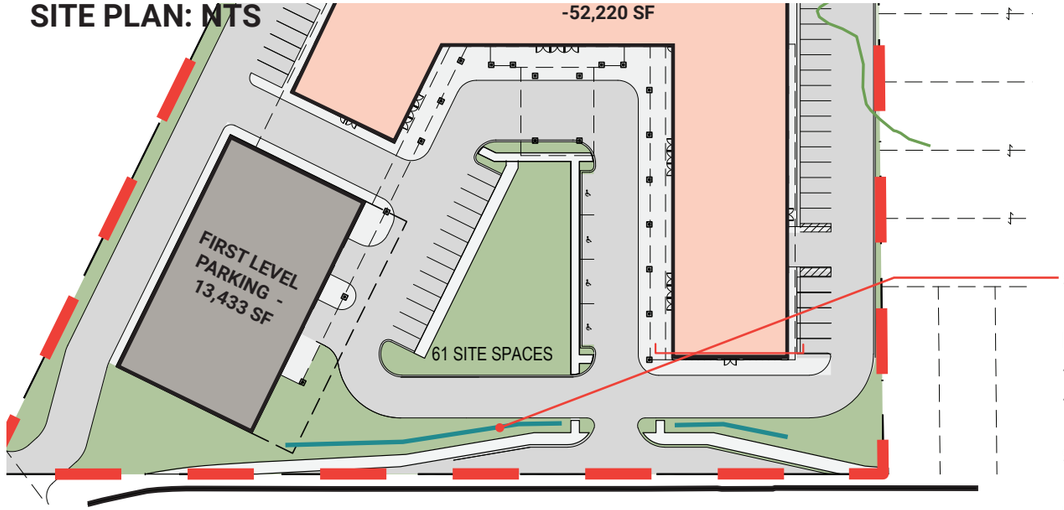
VERNAL EQUINOX - 9:00 AM

VERNAL EQUINOX - 12:00 PM

VERNAL EQUINOX - 4:00 PM

PROPOSED ENTRY SIGNAGE

SITE PLAN: NTS



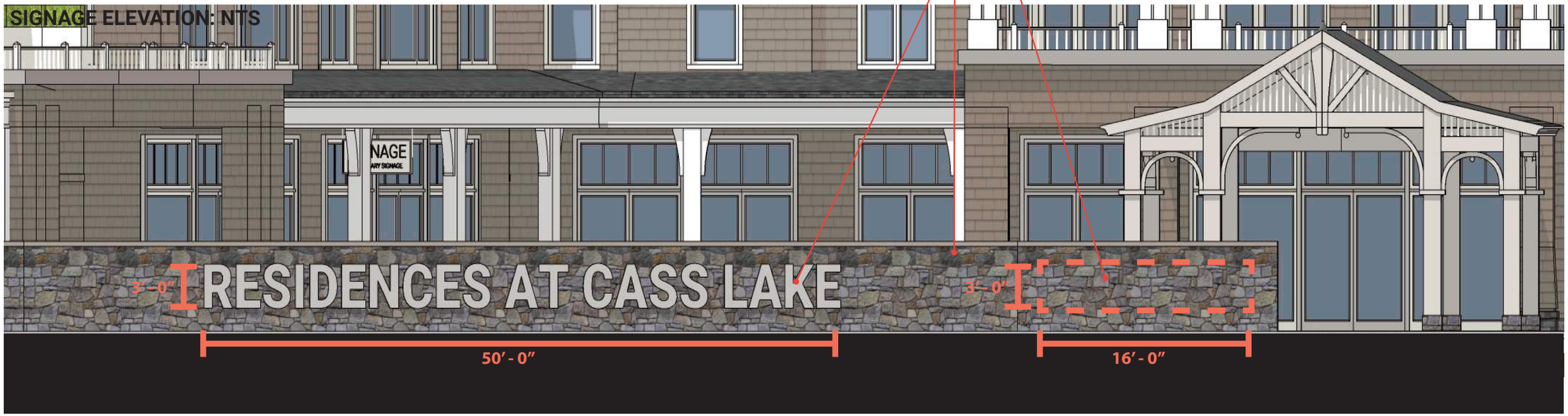
SIGNAGE AND SCREEN-WALL LOCATION

MULTIPLE TENANT SIGNS
-OVERALL AREA APPROX. 3'-0" X 16'-0"
-DETAILS AND QUANTITY OF SIGNS TBD

STONE SCREEN WALL -COLOR TBD

BACKLITE PIN MOUNTED SIGNAGE
-APPROX. 50'-0" X 3'-0"
-DETAILS TBD

SIGNAGE ELEVATION: NTS



SIGNAGE ANALYSIS SUMMARY

RMH - ONE FAMILY RESIDENTIAL DISTRICT

ZONING ORDINANCE REFERENCED:
Keego Harbor Zoning Ordinance

ALLOWED SIGNAGE AREA:
MAXIMUM HEIGHT: 8'
MAXIMUM AREA: 30 SF

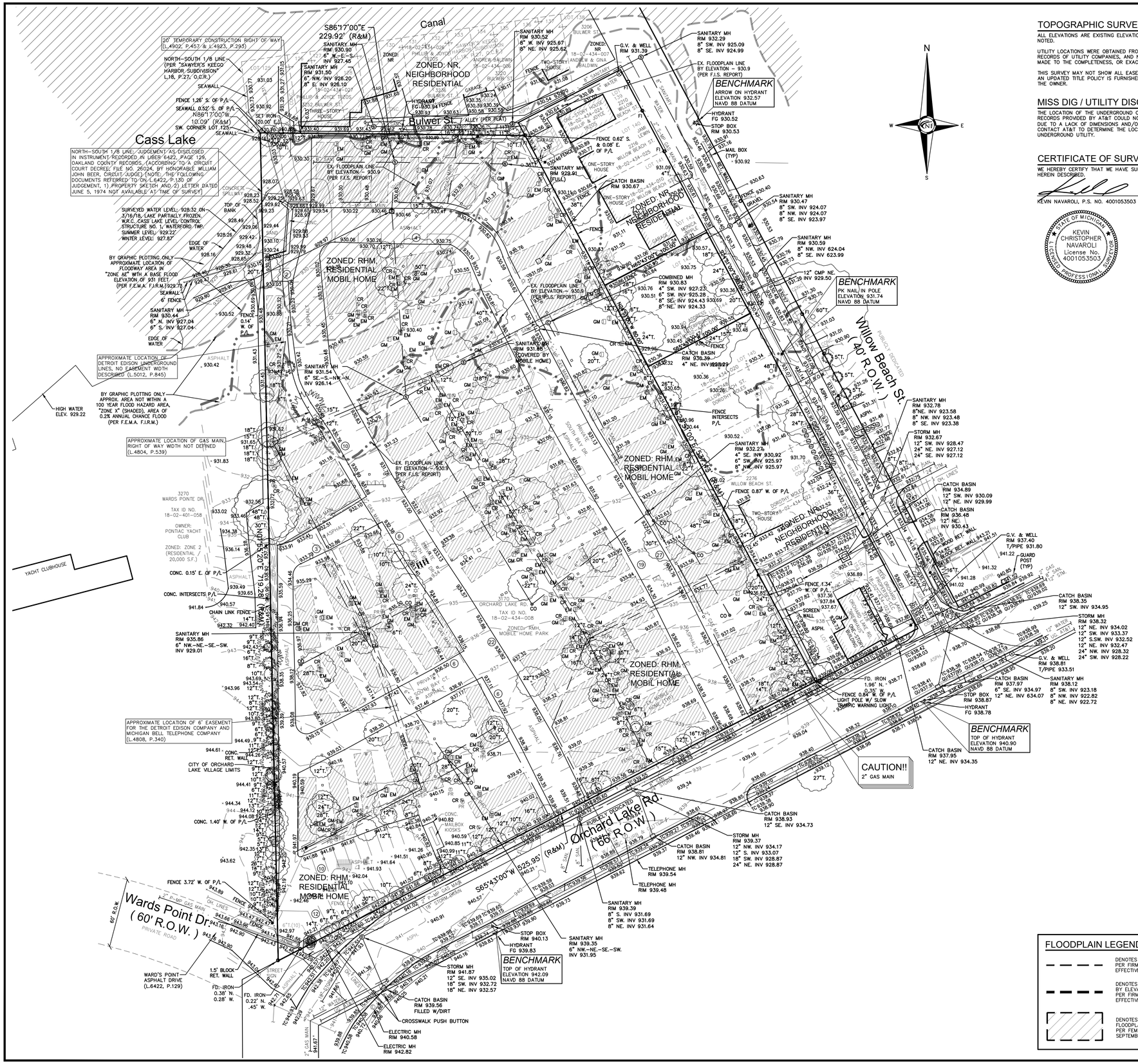
PROPOSED SIGNAGE AREA:
-MAIN SIGN
LENGTH: 50'-0"
HEIGHT: 3'-0"
AREA: 150 SF
-TENANT SIGNAGE (AT SCREEN WALL)
LENGTH: 16'-0"
HEIGHT: 3'-0"
AREA: 48 SF
TOTAL AREA: 198 SF

RETAIL SIGNAGE AREA:
EACH USE PERMITTED UP TO 3 SIGNS

DESIGN *FORWARD*

THANK YOU

architecture
NEUMANN SMITH



TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER.

MISS DIG / UTILITY DISCLAIMER NOTE

THE LOCATION OF THE UNDERGROUND CABLE SHOWN ON THE RECORDS PROVIDED BY AT&T COULD NOT BE ACCURATELY PLOTTED DUE TO A LACK OF DIMENSIONS AND/OR SCALE. CLIENT SHALL CONTACT AT&T TO DETERMINE THE LOCATION OF THE UNDERGROUND UTILITY.

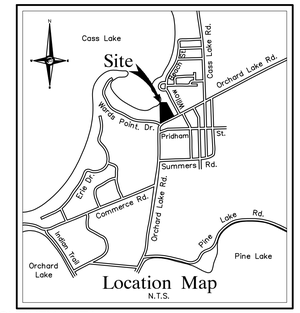
CERTIFICATE OF SURVEY

WE HEREBY CERTIFY THAT WE HAVE SURVEYED THE PROPERTY HEREIN DESCRIBED.

7-22-2021

KEVIN NAVAROLI, P.S. NO. 4001053503 DATE

STATE OF MICHIGAN
KEVIN CHRISTOPHER NAVAROLI
License No. 4001053503
LICENSED PROFESSIONAL SURVEYOR



SURVEY DATA

SITE AREA (TAX ID NO. 18-02-434-008): 223,971.35 SQUARE FEET OR 5.141 ACRES

SITE AREA (TAX ID NO. 18-02-434-019): 7,999.61 SQUARE FEET OR 0.184 ACRES

TOTAL SITE AREA: 231,970.96 SQUARE FEET OR 5.325 ACRES

ZONED: RMH (MOBILE HOME PARK), NR (NEIGHBORHOOD RESIDENTIAL)

PARKING SPACES: 127 REGULAR PARKING SPACES

NOTE: A ZONING REPORT OR LETTER HAS NOT BEEN FURNISHED BY THE CLIENT TO THE SURVEYOR, THEREFORE NO ADDITIONAL ZONING INFORMATION CAN BE SHOWN.

LEGAL DESCRIPTION - PER TITLE COMMITMENT

A PARCEL OF LAND SITUATED IN PART OF THE SOUTHEAST 1/4 OF SECTION 2, TOWN 2 NORTH, RANGE 9 EAST, CITY OF KEEGO HARBOR, OAKLAND COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE SOUTHWEST CORNER OF SAWYER'S KEEGO HARBOR SUBDIVISION, AS RECORDED IN LIBER 18 OF PLATS, PAGE 27, OAKLAND COUNTY RECORDS, SAID POINT BEING ON THE NORTHERLY RIGHT OF WAY LINE OF ORCHARD LAKE ROAD, AS IT EXISTS; THENCE SOUTH 65 DEGREES 43 MINUTES WEST 525.95 FEET ALONG THE NORTHERLY LINE OF ORCHARD LAKE ROAD TO A MONUMENT ON THE NORTH AND SOUTH 1/8 LINE, SAID MONUMENT AND NORTH AND SOUTH 1/8 SECTION LINE BEING THE ONE AND THE SAME ESTABLISHED BY SPALDING DEDECKER AND ASSOCIATES, INC., OF BIRMINGHAM, MICHIGAN, ENGINEERS FOR THE CITY OF KEEGO HARBOR, MICHIGAN, ACCORDING TO A CIRCUIT COURT DECREE, FILE NO. 26024, BY HONORABLE WILLIAM JOHN BEER, CIRCUIT JUDGE; THENCE NORTH 01 DEGREES 55 MINUTES 20 SECONDS EAST ALONG THE AFOREMENTIONED NORTH AND SOUTH 1/8 SECTION LINE OF THE SOUTHEAST 1/4 OF SAID SECTION 2, A DISTANCE OF 719.26 FEET TO A POINT IN THE SOUTHERLY BOUNDARY OF AFOREMENTIONED "SAWYER'S KEEGO HARBOR SUBDIVISION", SAID POINT BEING IN THE LAKE AND S.86°17'E., 10.09 FEET FROM THE NORTH AND SOUTH 1/8 LINE, AS RECORDED IN THE DESCRIPTION OF SAWYER'S KEEGO HARBOR SUBDIVISION, IN LIBER 18 OF PLATS, PAGE 27, OAKLAND COUNTY RECORDS; THENCE SOUTH 86 DEGREES 17 MINUTES EAST ALONG THE SOUTHERLY BOUNDARY OF SAWYER'S KEEGO HARBOR SUBDIVISION, A DISTANCE OF 229.91 FEET TO A POINT; THENCE SOUTH 24 DEGREES 51 MINUTES EAST ALONG THE WESTERLY BOUNDARY OF SAID SAWYER'S KEEGO HARBOR SUBDIVISION, A DISTANCE OF 537.43 FEET TO THE POINT OF BEGINNING.

TAX ID NO. 18-02-434-008
ADDRESS: 3170 ORCHARD LAKE ROAD, KEEGO HARBOR, MI 48320

LEGAL DESCRIPTION - PER TAX RECORDS

LOTS 143 AND 144 "SAWYER'S KEEGO HARBOR SUBDIVISION" BEING PART OF THE SOUTHEAST 1/4 OF SECTION 2, TOWN 2 NORTH, RANGE 9 EAST, CITY OF KEEGO HARBOR, OAKLAND COUNTY, MICHIGAN. AS RECORDED IN LIBER 18 OF PLATS, ON PAGE 27, OAKLAND COUNTY RECORDS.

TAX ID NO. 18-02-434-019
ADDRESS: VACANT WILLOW BEACH STREET, KEEGO HARBOR, MI

FLOOD HAZARD NOTE

BY GRAPHIC PLOTTING ONLY, A PORTION OF THE PROPERTY DESCRIBED ON THIS SURVEY LIES WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY; THE PROPERTY LIES WITHIN ZONE(S) "AE" AND "X" OF THE FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 26125C0501F BEARING AN EFFECTIVE DATE OF SEPTEMBER 29, 2006.

MISS DIG / UTILITY DISCLAIMER NOTE

A MISS DIG TICKET NUMBER A011830646, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS ENTERED FOR THE SURVEYED PROPERTY. DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEY MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON JULY 22, 2021. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR IN THE FIELD OR AS DEPICTED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNERS AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.

LEGEND

MANHOLE(MH)	EXISTING SANITARY SEWER
CO	EXISTING SAN. CLEAN OUT
HYDRANT / GATE VALVE	EXISTING WATER MAIN
MANHOLE / CATCH BASIN(CB)	EXISTING STORM SEWER
CBB	EX. R.Y. CATCH BASIN
	EX. UNDERGROUND (UG.) CABLE
UTILITY POLE / GUY POLE / UP / GUY WIRE	OVERHEAD (OH.) LINES
LP	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
ASPH.	ASPHALT
CONC.	CONCRETE
FI / FD.	FOUND IRON
RET. WALL	RETAINING WALL
R.O.W.	RIGHT-OF-WAY
GSV	GAS VALVE
(TYP)	TYPICAL
(R)	RECORD
(M)	MEASURED
CO	CLEAN OUT
GM	GAS METER
EM	ELECTRIC METER
CR	CABLE RISER
PR	PHONE RISER
DEP	DETROIT EDISON PAD
12"T.	12" TREE
P/L	PROPERTY LINE

FLOODPLAIN LEGEND

- DENOTES EXISTING FLOODPLAIN LINE PER FIRM MAP NO. 26125C0501F EFFECTIVE: SEPTEMBER 29, 2006
- DENOTES EXISTING FLOODPLAIN LINE BY ELEVATION: 930.9 PER FIRM MAP NO. 26125C0501F EFFECTIVE: SEPTEMBER 29, 2006
- DENOTES SFHA – FLOODPLAIN ZONE AE PER FEMA MAP 26125C0501F SEPTEMBER 29, 2006

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SEAL

PROJECT
Residences @ Cass Lake
3170 Orchard Lake Road
Keego Harbor, MI 48320

CLIENT
TIR Equities
217 Pierce St. Suite 209
Birmingham, MI 48009

Contact: Ara Darakjian
Email: ara.d@tirequities.com

PROJECT LOCATION
Part of the SE 1/4 of Section 2
T.2N., R.10E.
City of Keego Harbor, Oakland County, Michigan

SHEET
PUD-Boundary, Topographic, Tree, Survey / Soils Map

Know what's below Call before you dig.

DATE	ISSUED/REVISED
05-03-23	Revised per City / Owner
06-13-23	Revised per Owner / Arch.
06-21-23	Revised per Landscape Arch.
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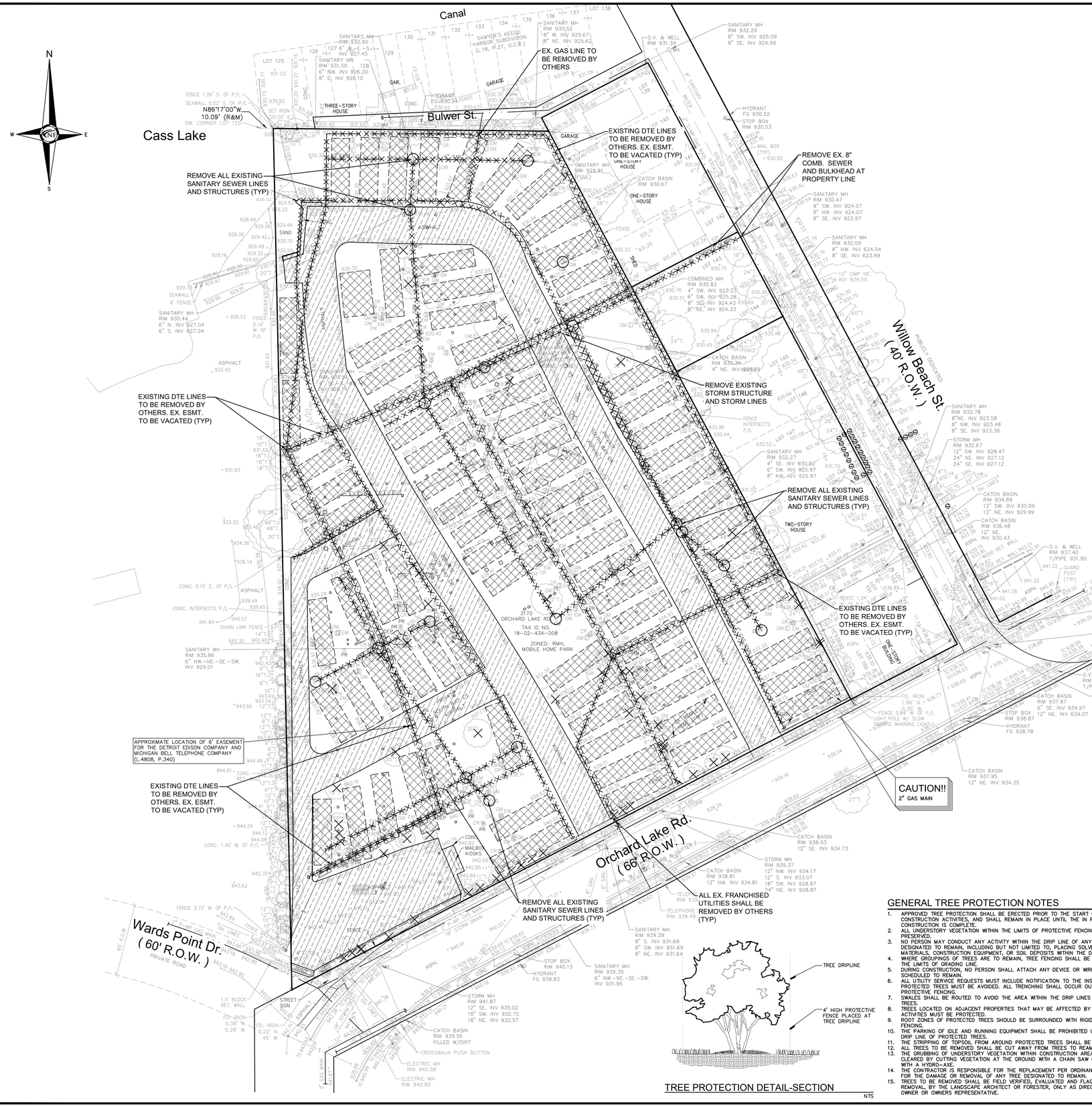
07-10-23	Final PUD Submittal

DRAWN BY: M. Carnaghi
DESIGNED BY:
APPROVED BY: K. Navaroli
DATE: April. 26, 2023
SCALE: 1" = 40'
40 20 0 20 40 60
NFE JOB NO. K308
SHEET NO. C-01

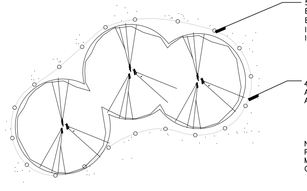


TREE PROTECTION DETAIL-SECTION

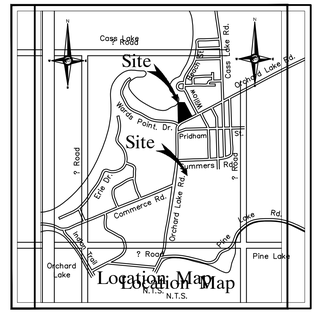
NTS

GENERAL TREE PROTECTION NOTES

1. APPROVED TREE PROTECTION SHALL BE ERECTED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES, AND SHALL REMAIN IN PLACE UNTIL THE IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
2. ALL UNDERSTORY VEGETATION WITHIN THE LIMITS OF PROTECTIVE FENCING SHALL BE PRESERVED.
3. NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN, INCLUDING BUT NOT LIMITED TO, PLACING SOLVENTS, BUILDING MATERIALS, CONSTRUCTION EQUIPMENT, OR SOIL DEPOSITS WITHIN THE DRIP LINE.
4. WHERE GROUPINGS OF TREES ARE TO REMAIN, TREE FENCING SHALL BE PLACED AT THE LIMITS OF GRADING LINE.
5. DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY DEVICE OR WIRE TO ANY TREE, SCHEDULED TO REMAIN.
6. ALL UTILITY SERVICE REQUESTS MUST INCLUDE NOTIFICATION TO THE INSTALLER THAT PROTECTED TREES MUST BE AVOIDED. ALL TRENCHING SHALL OCCUR OUTSIDE OF THE PROTECTIVE FENCING.
7. SWALES SHALL BE ROUTED TO AVOID THE AREA WITHIN THE DRIP LINES OF PROTECTED TREES.
8. TREES LOCATED ON ADJACENT PROPERTIES THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.
9. ROOT ZONES OF PROTECTED TREES SHOULD BE SURROUNDED WITH RIGIDLY STAKED FENCING.
10. THE PARKING OF IDLE AND RUNNING EQUIPMENT SHALL BE PROHIBITED UNDER THE DRIP LINE OF PROTECTED TREES.
11. THE STRIPPING OF TOPSOIL FROM AROUND PROTECTED TREES SHALL BE PROHIBITED.
12. ALL TREES TO BE REMOVED SHALL BE CUT AWAY FROM TREES TO REAMIN.
13. THE GRUBBING OF UNDERSTORY VEGETATION WITHIN CONSTRUCTION AREAS SHOULD BE CLEARED BY CUTTING VEGETATION AT THE GROUND WITH A CHAIN SAW OR MINIMALLY WITH A HYDRO-AXE.
14. THE CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT PER ORDINANCE GUIDELINES, FOR THE DAMAGE OR REMOVAL OF ANY TREE DESIGNATED TO REMAIN.
15. TREES TO BE REMOVED SHALL BE FIELD VERIFIED, EVALUATED AND FLAGGED FOR REMOVAL, BY THE LANDSCAPE ARCHITECT OR FORESTER, ONLY AS DIRECTED BY THE OWNER OR OWNERS REPRESENTATIVE.



TREE PROTECTION DETAIL-PLAN



DEMOLITION LEGEND

- INDICATES LIMITS OF COMPLETE BUILDING REMOVAL AND DEMOLITION.
- INDICATES LIMITS OF PAVEMENT, CURB, SIDEWALK AND LANDSCAPE REMOVAL AND DEMOLITION.
- XXXXXX INDICATES REMOVAL OF EXISTING UNDERGROUND OR OVERHEAD UTILITY LINE.
- // // // // INDICATES ABANDONMENT OF EXISTING UNDERGROUND OR OVERHEAD UTILITY LINE.
- ○ INDICATES COMPLETE REMOVAL OF EXISTING UTILITY STRUCTURE.
- ⊗ INDICATES TREE / SHRUB REMOVAL.

DEMOLITION NOTES

DEMOLITION OF SITE IMPROVEMENTS SHALL BE ALLOWED ONLY AFTER AN APPROVED PERMIT HAS BEEN SECURED FROM THE PUBLIC AGENCY HAVING JURISDICTION OVER SAID DEMOLITION.

FOR ANY DEMOLITION WITHIN PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL PAY FOR, AND SECURE, ALL NECESSARY PERMITS AND LIKEWISE SHALL ARRANGE FOR ALL SITE INSPECTIONS.

SITE DEMOLITION INCLUDES THE COMPLETE REMOVAL OF SITE IMPROVEMENTS AND OFF-SITE DISPOSAL. DEBRIS SHALL BE TRANSPORTED TO AN APPROPRIATE DISPOSAL FACILITY THAT IS LICENSED FOR THAT TYPE OF DEBRIS.

THE CONTRACTOR SHALL COORDINATE TRUCK ROUTES WITH THE MUNICIPALITY PRIOR TO COMMENCEMENT OF SITE DEMOLITION. ALL TRUCKS SHALL BE TARPED OR PROPERLY SECURED TO CONTAIN DEMOLITION DEBRIS PRIOR TO LEAVING SITE.

EXISTING ON-SITE UNDERGROUND UTILITIES AND BUILDING SERVICES HAVE BEEN INDICATED BASED UPON THE BEST AVAILABLE UTILITY RECORDS AND/OR ON-SITE INSPECTION. NO GUARANTEE IS MADE BY THE DESIGN ENGINEER, AS TO THE COMPLETENESS OR ACCURACY OF UTILITY DATA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF UTILITY INFORMATION (THE DESIGN ENGINEER MAKES NO GUARANTEE NOR ASSUMES ANY LIABILITY AS TO THE COMPLETENESS AND/OR ACCURACY OF UTILITY DATA).

PRIOR TO THE REMOVAL OR ABANDONMENT OF ANY EXISTING UNDERGROUND UTILITY OR BUILDING SERVICE LINES CALLED FOR IN THE PLANS OR DISCOVERED DURING EXCAVATION, THE CONTRACTOR MUST DETERMINE IF THE UTILITY LINE OR BUILDING SERVICE IS STILL IN USE. IF THE UTILITY LINE OR BUILDING SERVICE IS STILL IN USE/ACTIVE THE CONTRACTOR MUST TAKE ALL THE NECESSARY STEPS TO GUARANTEE THAT THE UTILITY LINE OR BUILDING SERVICE IS RECONNECTED WITHOUT AN INTERRUPTION IN SERVICE. THE RECONNECTION OF THE UTILITY LINE OR BUILDING SERVICE MUST BE IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE APPROPRIATE GOVERNMENTAL AGENCY OR PRIVATE UTILITY COMPANY.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO SITE DEMOLITION.

* THE CONTRACTOR SHALL NOTIFY MISS DIG (1-800-482-7171) A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE START OF THE SITE DEMOLITION.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH THE DETROIT EDISON COMPANY. REMOVAL OF DETROIT EDISON ELECTRICAL SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF DETROIT EDISON.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH CONSUMERS ENERGY/MICHCON. REMOVAL OF CONSUMERS ENERGY/ MICHCON GAS SERVICES SHALL BE IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF CONSUMERS ENERGY/MICHCON.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH AMERITECH. REMOVAL OF AMERITECH COMMUNICATION SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF AMERITECH.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH THE APPROPRIATE CABLE MEDIA COMPANY. REMOVAL OF CABLE SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF THE CABLE COMPANY.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF PRIVATE UTILITY COMPANIES AND COORDINATE UTILITY SERVICE SHUT OFF/DISCONNECT, PRIOR TO DEMOLITION OF EXISTING STRUCTURES OR PROPERTIES.

ALL UTILITY METERS SHALL BE REMOVED BY THE APPROPRIATE UTILITY COMPANY.

ANY ON-SITE STORM SEWER FACILITIES LOCATED DURING DEMOLITION SHALL BE REMOVED AND BULK HEADED AT THE PROPERTY LINE IF INDICATED FOR REMOVAL ON THE PLANS.

PRIOR TO BUILDING DEMOLITION, ALL HAZARDOUS MATERIAL SHALL BE REMOVED BY OTHERS. THE DEMOLITION CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER SHOULD ANY SUSPICIOUS MATERIAL BE FOUND.

WATER SERVICES AND/OR STOP-BOX SHALL BE PRESERVED AND BULK HEADED AT THE PROPERTY LINE OR AS DIRECTED BY THE OWNER'S REPRESENTATION.

WHERE EXISTING BUILDINGS PLANED FOR DEMOLITION FALL WITHIN PROPOSED BUILDING FOOT PRINTS, BASEMENT FLOOR SLABS, FOUNDATION WALLS AND FOOTINGS SHALL BE COMPLETELY REMOVED AND BACK FILLED WITH MDOT CLASS II GRANULAR MATERIAL AND BE MACHINE COMPACTED TO A MINIMUM OF 98% OF MATERIALS MAXIMUM DENSITY.

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SEAL

STATE OF MICHIGAN
PATRICK J. WILLIAMS
ENGINEER NO. 24031
LICENSED PROFESSIONAL ENGINEER

PROJECT

Residences @ Cass Lake
3170 Orchard Lake Road
Keego Harbor, MI 48320

CLIENT

TIR Equities
217 Pierce St. Suite 209
Birmingham, MI 48009

Contact: Ara Darakjian
Email: ara.d@tirequities.com

PROJECT LOCATION

Part of the SE 1/4 of Section 2
T.2N., R.10E.
City of Keego Harbor, Oakland County, Michigan

SHEET

PUD-
Demolition Plan

Know what's below Call before you dig.

DATE	ISSUED/REVISED
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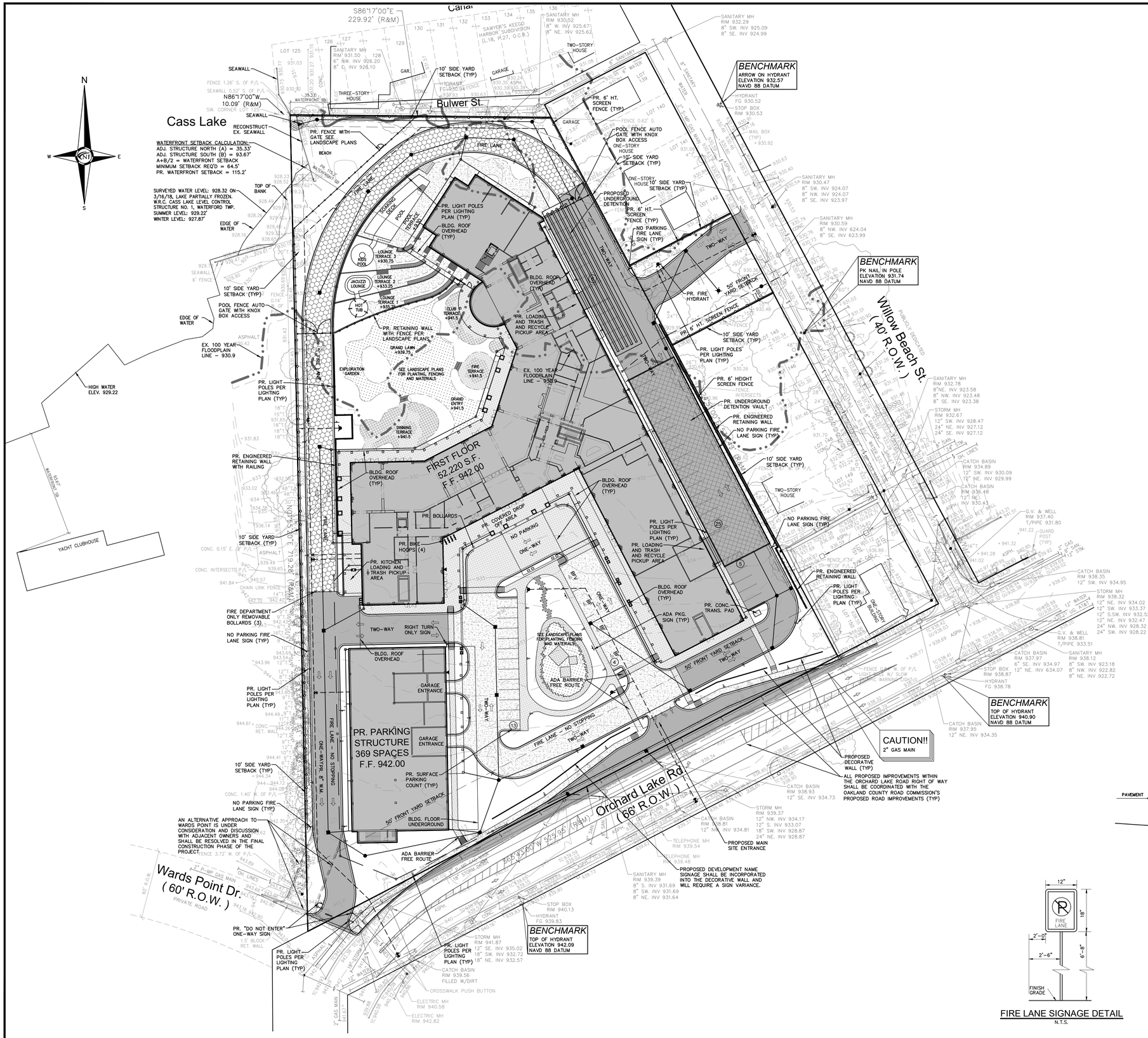
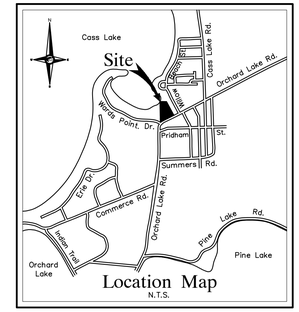
DRAWN BY: A. Wiseman
DESIGNED BY: A. Wiseman
APPROVED BY: P. Williams
DATE: April. 26, 2023
SCALE: 1" = 40'

40 20 0 20 40 60

NFE JOB NO. K308
SHEET NO. C-02





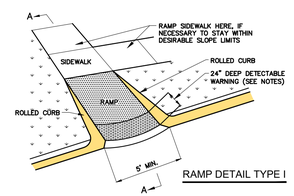
LEGEND

- EXISTING SANITARY SEWER
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EXISTING BURIED CABLES
- EXISTING GAS MAIN
- EXISTING OVERHEAD LINES
- PR. SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PR. SAND BACKFILL
- UTILITY CROSSING
- PR. TOP OF CURB ELEVATION (TC 600.00)
- PROPOSED GUTTER ELEVATION (GU 600.00)
- PR. TOP OF WALK ELEVATION (TW 600.00)
- PR. TOP OF PAVEMENT ELEV. (TP 600.00)
- PROPOSED FINISH GRADE (FG 600.00)
- PROPOSED CONTOUR (600)
- PROPOSED SWALE
- PR. DRAINAGE DIRECTION
- PROPOSED INLET FILTER
- DRAINAGE AREA LIMITS
- PROPOSED SILT FENCE
- LIMITS OF SOIL DISRUPTION

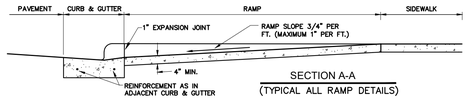
PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED GRASS PAVERS

SEE LANDSCAPE PLANS FOR ALTERNATIVE PAVING MATERIALS



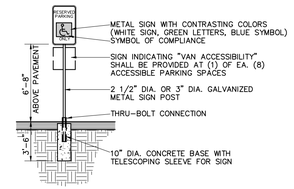
RAMP DETAIL TYPE I



SECTION A-A
(TYPICAL ALL RAMP DETAILS)

MDOT SIDEWALK RAMP DETAIL TYPE 1
N.T.S.

FIRE LANE SIGNAGE DETAIL
N.T.S.



BARRIER FREE PARKING SIGN DETAIL
N.T.S.
Provide (1) for each accessible parking space

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PROJECT LOCATION
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SHEET
PUD-
Dimensional Site Plan

Know what's below Call before you dig. 811

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DRAWN BY: A. Wiseman
DESIGNED BY: A. Wiseman
APPROVED BY: P. Williams
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SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. K308
SHEET NO. C-03

CONCRETE CURB DETAIL 'A'
N.T.S.

CONCRETE CURB DETAIL 'B'
N.T.S.

ASPHALT PAVEMENT SECTION
(DRIVE AND PARKING)

CONCRETE PAVEMENT SECTION
N.T.S.

6" MONOLITHIC CURB AND WALK
N.T.S.

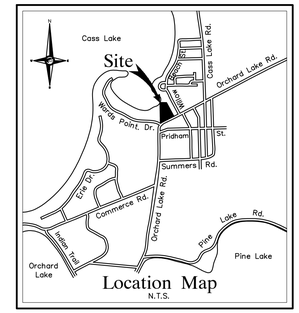
CONCRETE SIDEWALK SECTION
N.T.S.

DEEP STRENGTH ASPHALT SECTION
N.T.S.

COMMERCIAL CONCRETE SIDEWALK DETAIL
N.T.S.

AIRPAVE GRASS PAVER SECTION
N.T.S.

MDOT DRIVEWAY OPENING DETAIL 'M'
N.T.S.



LEGEND

- EXISTING SANITARY SEWER (CLEAN–OUT, MANHOLE)
- EXISTING WATER MAIN (HYDRANT, GATE VALVE)
- EXISTING STORM SEWER (INLET, RYCB, MANHOLE, CB)
- EXISTING BURIED CABLES
- EXISTING GAS MAIN
- EXISTING OVERHEAD LINES (UTILITY POLE, GUY POLE, GUY WIRE)
- EXISTING LIGHT POLE, EXISTING SIGN
- PR. SANITARY SEWER (C.O., MANHOLE)
- PROPOSED WATER MAIN (HYDRANT, GATE VALVE)
- PROPOSED STORM SEWER (INLET, RYCB, MANHOLE, CB)
- PR. SAND BACKFILL (COMPACT TO 95% MAX. DENSITY)
- UTILITY CROSSING (A)
- PR. TOP OF CURB ELEVATION (TC 600.00)
- PROPOSED GUTTER ELEVATION (GU 600.00)
- PR. TOP OF WALK ELEVATION (TW 600.00)
- PR. TOP OF PAVEMENT ELEV. (TP 600.00)
- PROPOSED FINISH GRADE (FG 600.00)
- PROPOSED CONTOUR (600)
- PROPOSED SWALE
- PR. DRAINAGE DIRECTION
- PROPOSED INLET FILTER
- DRAINAGE AREA LIMITS
- PROPOSED SILT FENCE
- LIMITS OF SOIL DISRUPTION

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED GRASS PAVERS

SEE LANDSCAPE PLANS FOR ALTERNATIVE PAVING MATERIALS

CUT / FILL LEGEND

- PR. CUT IN 100 YR. FLOODPLAIN
- PR. FILL IN 100 YR. FLOODPLAIN

GENERAL PAVING NOTES

PAVEMENT SHALL BE OF THE TYPE, THICKNESS AND CROSS SECTION AS INDICATED ON THE PLANS AND AS FOLLOWS:

CONCRETE: PORTLAND CEMENT TYPE IA (AIR–ENTRAINED) WITH A MINIMUM CEMENT CONTENT OF SIX SACKS PER CUBIC YARD, MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,500 PSI AND A SLUMP OF 1 1/2 TO 3 INCHES.

ASPHALT: BASE COURSE – MDOT BITUMINOUS MIXTURE NO. 1100L, 20AA; SURFACE COURSE – MDOT BITUMINOUS MIXTURE NO. 1100T, 20AA; ASPHALT CEMENT PENETRATION GRADE 85–100, BOND COAT – MDOT SS–1H EMULSION AT 0.10 GALLON PER SQUARE YARD; MAXIMUM 2 INCH LIFT.

PAVEMENT BASE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT. EXISTING SUB–BASE SHALL BE PROOF–ROLLED IN THE PRESENCE OF THE ENGINEER TO DETERMINE STABILITY.

ALL CONCRETE PAVEMENT, DRIVEWAYS, CURB & GUTTER, ETC., SHALL BE SPRAY CURED WITH WHITE MEMBRANE CURING COMPOUND IMMEDIATELY FOLLOWING FINISHING OPERATION.

ALL CONCRETE PAVEMENT JOINTS SHALL BE FILLED WITH HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND IMMEDIATELY AFTER SAWCUT OPERATION. FEDERAL SPECIFICATION SS–S164.

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT EDITION.

ALL TOP OF CURB ELEVATIONS, AS SHOWN ON THE PLANS, ARE CALCULATED FOR A 6" CONCRETE CURB UNLESS OTHERWISE NOTED.

ALL SIDEWALK RAMPS, CONFORMING TO PUBLIC ACT NO. 8, 1993, SHALL BE INSTALLED AS INDICATED ON THE PLANS.

CONSTRUCTION OF A NEW OR RECONSTRUCTED DRIVE APPROACH CONNECTING TO AN EXISTING STATE OR COUNTY ROADWAY SHALL BE ALLOWED ONLY AFTER AN APPROVED PERMIT HAS BEEN SECURED FROM THE AGENCY HAVING JURISDICTION OVER SAID ROADWAY.

FOR ANY WORK WITHIN THE PUBLIC RIGHT–OF–WAY, THE CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS AND LIKEWISE ARRANGE FOR ALL INSPECTION.

EXISTING TOPSOIL, VEGETATION AND ORGANIC MATERIALS SHALL BE STRIPPED AND REMOVED FROM PROPOSED PAVEMENT AREA PRIOR TO PLACEMENT OF BASE MATERIALS.

EXPANSION JOINTS SHOULD BE INSTALLED AT THE END OF ALL INTERSECTION RADII.

SIDEWALK RAMPS, CONFORMING TO PUBLIC ACT NO. 8, 1973, SHALL BE INSTALLED AS SHOWN AT ALL STREET INTERSECTIONS AND AT ALL BARRIER FREE PARKING AREAS AS INDICATED ON THE PLANS.

ALL PAVEMENT AREAS SHALL BE PROOF–ROLLED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF BASE MATERIALS AND PAVING MATERIALS.

FILL AREAS SHALL BE MACHINE COMPACTED IN UNIFORM LIFTS NOT EXCEEDING 9 INCHES THICK TO 98% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT.

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SEAL

STATE OF MICHIGAN
PATRICK J. WILLIAMS
ENGINEER
NO. 24001

PROJECT
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of Section 2
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SHEET
P.U.D. -
Paving & Grading Plan

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DRAWN BY:
A. Wiseman

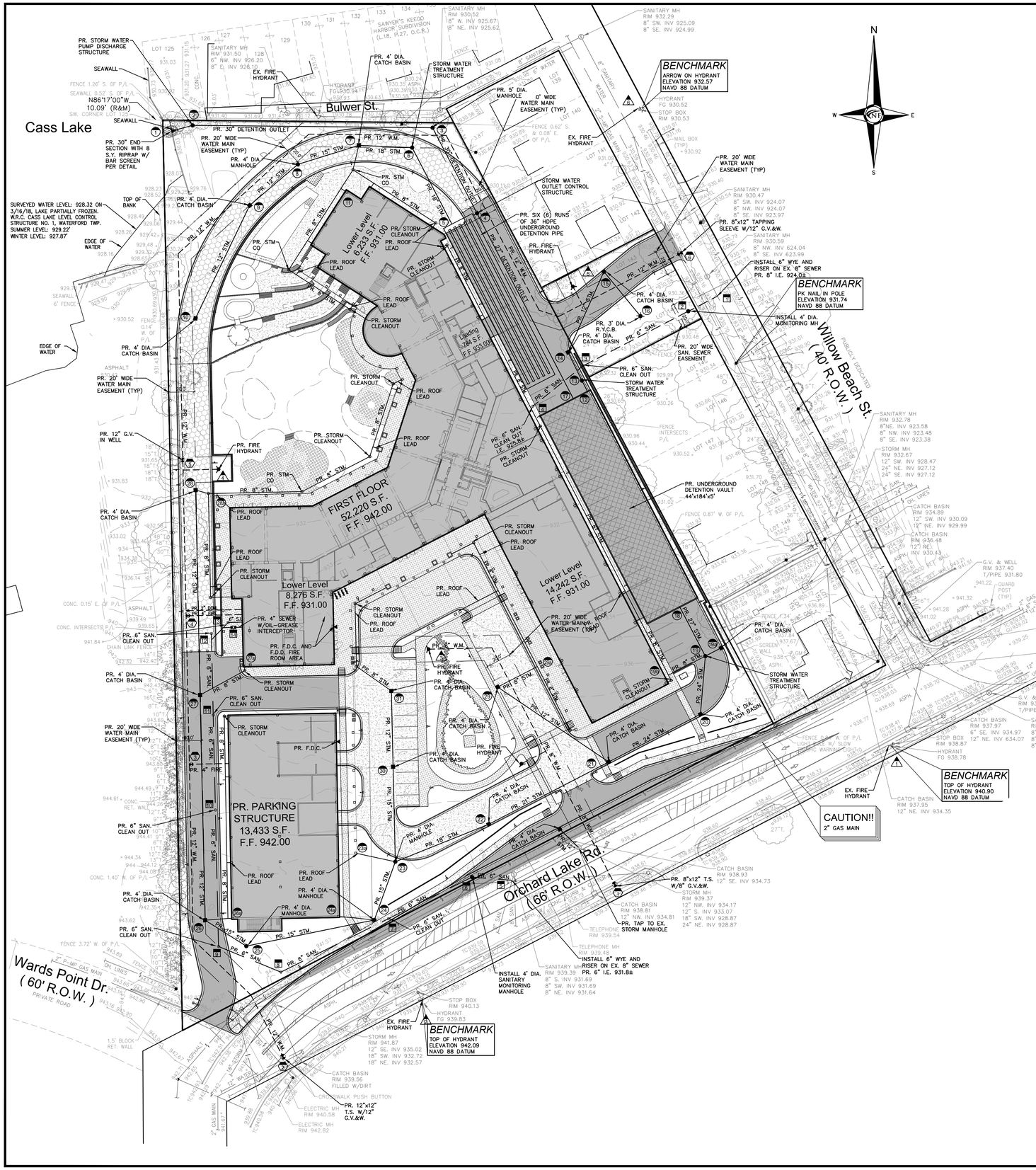
DESIGNED BY:
A. Wiseman

APPROVED BY:
P. Williams

DATE:
April. 26, 2023

SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. K308
SHEET NO. C-04


Cass Lake
Bulwer St.
Willow Beach St.
(40 R.O.W.)
Orchard Lake Rd.
(66' R.O.W.)
Wards Point Dr.
(60' R.O.W.)
PRIVATE ROAD
PUBLIC DEDICATED
PR. STORM WATER PUMP DISCHARGE STRUCTURE
SEAWALL
EX. FIRE HYDRANT
PR. 4' DIA. CATCH BASIN
STORM WATER TREATMENT STRUCTURE
PR. 5' DIA. MANHOLE
0' WIDE WATER MAIN EASEMENT (TYP)
PR. 30" DETENTION OUTLET
PR. 20' WIDE WATER MAIN EASEMENT (TYP)
PR. 15" STM.
PR. 18" STM.
PR. 12" W.M.
PR. 4' DIA MANHOLES
PR. 30" END SECTION WITH 8 S.Y. RIPRAP W/ BAR SCREEN PER DETAIL
SURVEYED WATER LEVEL: 928.32 ON 3/16/18, LAKE PARTIALLY FROZEN. W.R.C. CASS LAKE LEVEL CONTROL STRUCTURE NO. 1, WATERFORD TWP. SUMMER LEVEL: 929.22' WINTER LEVEL: 927.87'
TOP OF BANK
EDGE OF WATER
PR. STM CO
PR. 12" STM.
PR. 8" STM.
Lower Level 6,233 S.F. F.F. 931.00
PR. STORM CLEANOUT
PR. ROOF LEAD
PR. 6" STM.
PR. 20' WIDE WATER MAIN EASEMENT (TYP)
PR. 12" G.V. IN WELL
PR. FIRE HYDRANT
FIRST FLOOR 52,220 S.F. F.F. 942.00
PR. 8" STM.
PR. 4' DIA. CATCH BASIN
PR. 6" SAN. CLEAN OUT
PR. 4" SEWER W/OIL-GREASE INTERCEPTOR
PR. F.D.C. AND F.D.D. FIRE ROOM AREA
Lower Level 8,276 S.F. F.F. 931.00
PR. 6" SAN.
PR. 4" DIA. MANHOLE
PR. 15" STM.
PR. 24" STM.
PR. 21" STM.
PR. 27" STM.
PR. 4" DIA. CATCH BASIN
PR. 4" DIA. MANHOLE
PR. 20' WIDE WATER MAIN EASEMENT (TYP)
PR. F.D.C.
PR. 4" FIRE
PR. PARKING STRUCTURE 13,433 S.F. F.F. 942.00
PR. 6" SAN. CLEAN OUT
PR. 12" W.M.
PR. 12" STM.
PR. 8" SAN.
PR. 6" SAN.
PR. 18" STM.
PR. 12" STM.
PR. 15" STM.
PR. 4" DIA. CATCH BASIN
PR. 4" DIA. MANHOLE
PR. 6" SAN. CLEAN OUT
PR. 8" SAN.
PR. 6" SAN.
PR. 12" STM.
PR. 15" STM.
PR. 6" SAN.
PR. 8" SAN.
PR. 6" SAN.
PR. 12" W.M.
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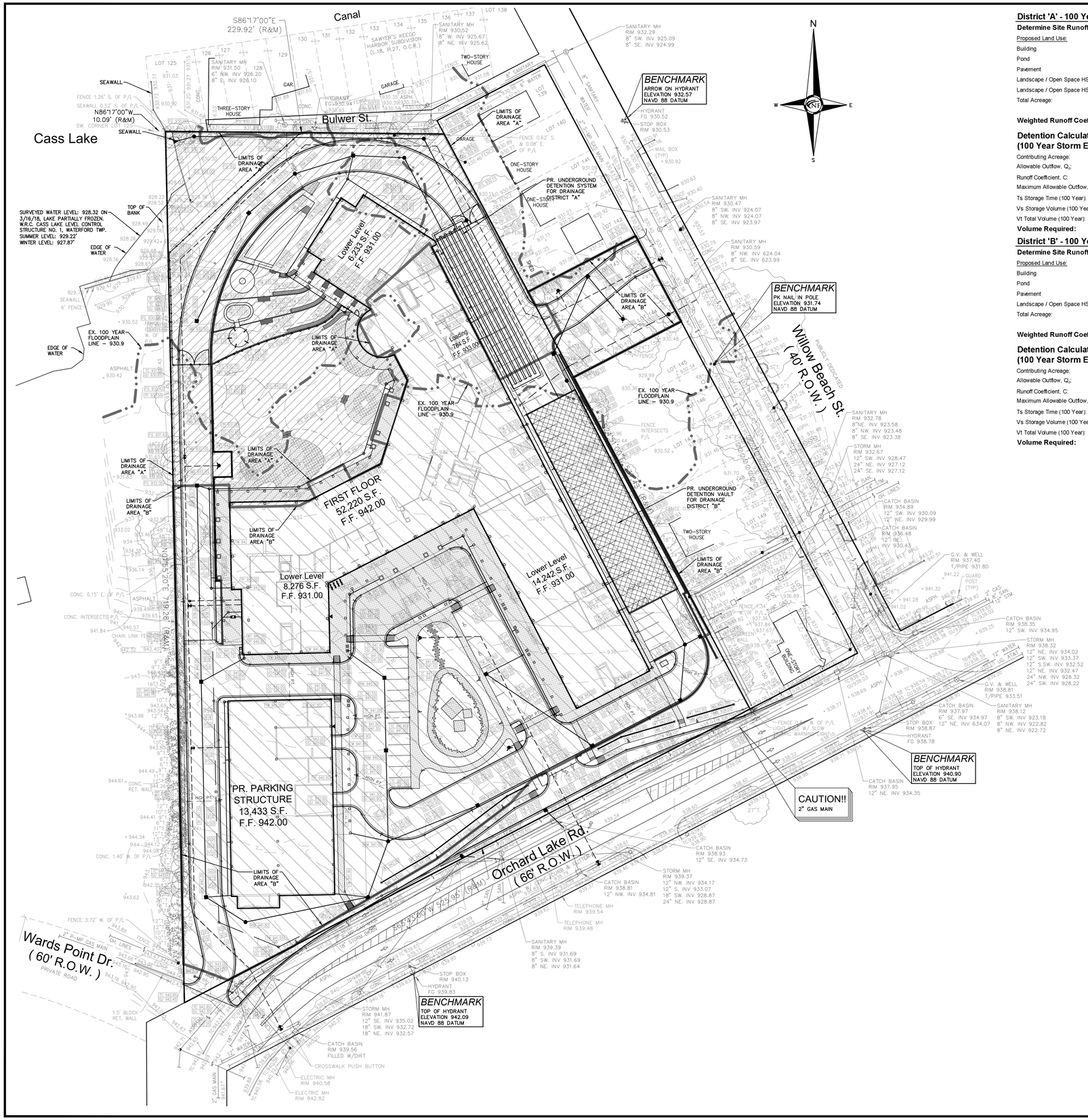
PR. 8" STM.
PR. 12" STM.
PR. 15" STM.
PR. 18" STM.
PR. 12" W.M.
PR. 12" STM.
PR. 8



District 'A' - 100 Year Storm Event

Determine Site Runoff Coefficient:

Proposed Land Use:	Runoff Coefficient:	Drainage Area:	
Building	0.95	0.091	Acres
Pond	0.95	0.000	Acres
Pavement	0.95	0.376	Acres
Landscape / Open Space HSG A:	0.15	0.682	Acres
Landscape / Open Space HSG D:	0.30	0.341	Acres
Total Acreage:		1.058	Acres

Weighted Runoff Coefficient "C" Factor = 0.475

Detention Calculation - Volume Required (100 Year Storm Event - With Outlet (Orifice)

Contributing Acreage:	1.058	Acres
Allowable Outflow, Q_o:	0.150	CFS / Acre
Runoff Coefficient, C:	0.475	Imperviousness
Maximum Allowable Outflow, Qo:	0.316	CFS / (Acre * Imperv.)
Ts Storage Time (100 Year):	155.739	Minutes
Vs Storage Volume (100 Year):	12,251.10	CFS / (Acre * Imperv.)
Vt Total Volume (100 Year):	6,158.77	Cubic Feet
Volume Required:	**6,159**	**Cubic Feet**

District 'B' - 100 Year Storm Event

Determine Site Runoff Coefficient:

Proposed Land Use:	Runoff Coefficient:	Drainage Area:	
Building	0.95	1.630	Acres
Pond	0.95	0.000	Acres
Pavement	0.95	1.467	Acres
Landscape / Open Space HSG A:	0.15	0.739	Acres
Total Acreage:		3.836	Acres

Weighted Runoff Coefficient "C" Factor = 0.796

Detention Calculation - Volume Required (100 Year Storm Event - With Outlet (Orifice)

Contributing Acreage:	3.836	Acres
Allowable Outflow, Q_o:	0.150	CFS / Acre
Runoff Coefficient, C:	0.796	Imperviousness
Maximum Allowable Outflow, Qo:	0.188	CFS / (Acre * Imperv.)
Ts Storage Time (100 Year):	208.916	Minutes
Vs Storage Volume (100 Year):	13,161.57	CFS / (Acre * Imperv.)
Vt Total Volume (100 Year):	40,182.27	Cubic Feet
Volume Required:	**40,182**	**Cubic Feet**

PROPOSED DETENTION STORAGE

District 'A' - 36" Dia. Underground Pipe

Pipe Dia (inches)	X-sec area (sq. ft.)	Length (LF)	Volume Provided (Cubic Feet)
36	7.07	873	6173.4

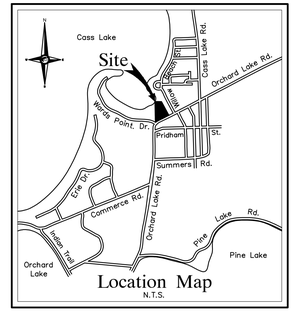
Volume Provided (Cu. Ft.) 6,173

District 'B' - 5' Height Underground Vault

Vault width (LF)	Vault legnth (LF)	Depth (Feet)	Volume Provided (Cubic Feet)
44	184.00	5	40480.0

Volume Provided (Cu. Ft.) 40,480

Top of Pavement at lowest point = 935.00
Top of Vault = 933.50
Top inside of Vault = 932.83
Invert of Vault = 927.83
Bottom of Vault = 927.16



LEGEND

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- EXISTING WATER MAIN (HYDRANT, GATE VALVE)
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- PROPOSED CONTOUR (600)
- PROPOSED SWALE
- PR. DRAINAGE DIRECTION
- PROPOSED INLET FILTER
- DRAINAGE AREA LIMITS
- PROPOSED SILT FENCE
- LIMITS OF SOIL DISRUPTION

DRAINAGE AREA LEGEND

- LIMITS OF DRAINAGE DISTRICT 'A'
- LIMITS OF DRAINAGE DISTRICT 'B'

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SEAL

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PROJECT
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217 Pierce St. Suite 209
Birmingham, MI 48009

Contact: Ara Darakjian
Email: ara.d@tirequities.com

PROJECT LOCATION
Part of the SE 1/4 of Section 2
T.2N., R.10E.
City of Keego Harbor, Oakland County, Michigan

SHEET
PUD-
Storm Drainage Districts and Detention Calculations

Know what's below Call before you dig. 811

DATE	ISSUED/REVISED
05-03-23	Revised per City / Owner
06-13-23	Revised per Owner / Arch.
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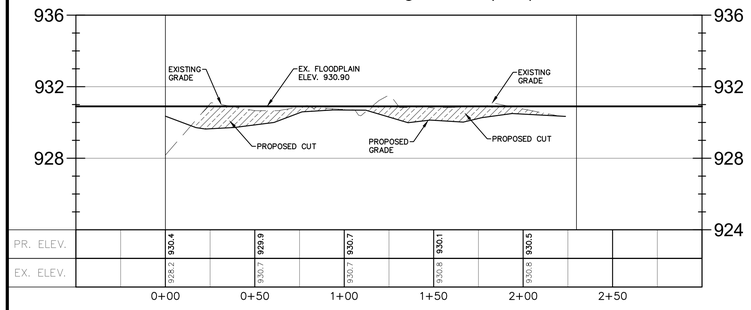
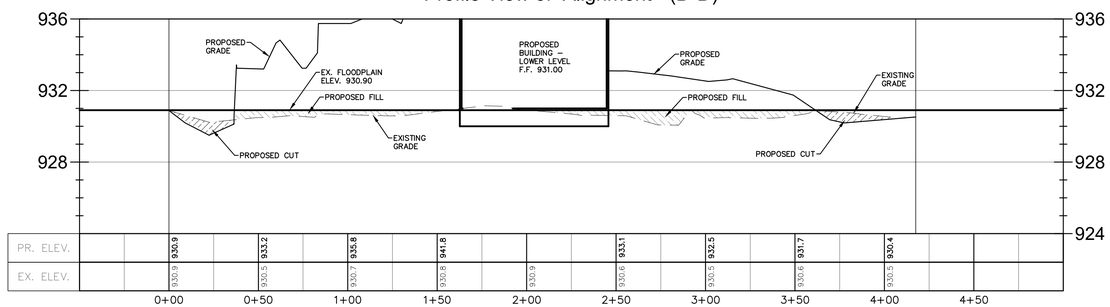
DRAWN BY: A. Wiseman
DESIGNED BY: A. Wiseman
APPROVED BY: P. Williams
DATE: April. 26, 2023
SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. K308
SHEET NO. C-06

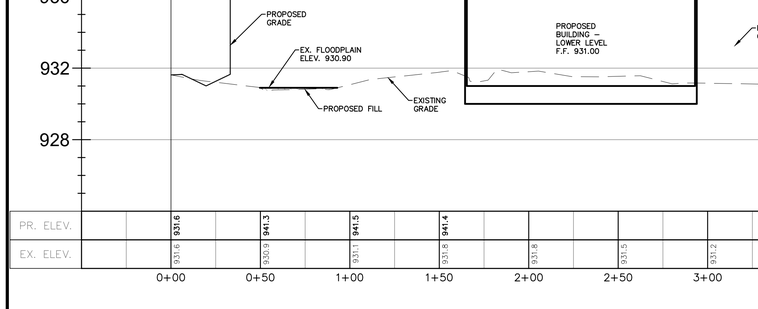
Profile View of Alignment - (A-A)



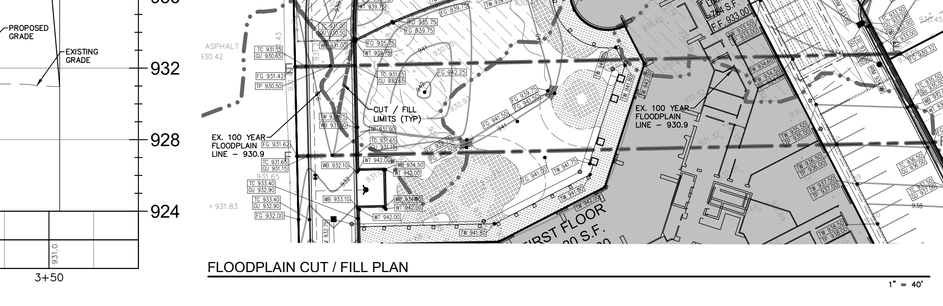
Profile View of Alignment - (D-D)



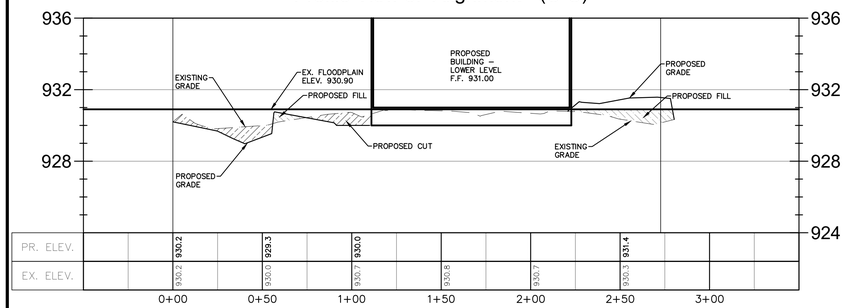
Profile View of Alignment - (B-B)



Profile View of Alignment - (E-E)



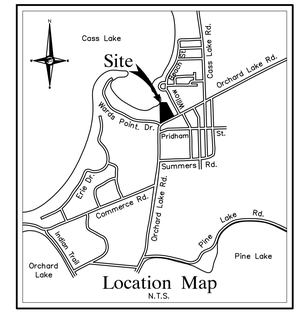
Profile View of Alignment - (C-C)



Profile View of Alignment - (F-F)

FLOODPLAIN CUT / FILL PLAN

1" = 40'



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CUT / FILL LEGEND

- PR. CUT IN 100 YR. FLOODPLAIN
- PR. FILL IN 100 YR. FLOODPLAIN

Cut / Fill Calculations

Section	SF-Cut	Depth	SF-Fill	Depth	Avg. Cut	Avg. Fill	Run	CF-Cut	CF-Fill	CY-Cut	CY-Fill
A-A	11621.00	1.90	73.00	0.10							
					10422.50	2074.50	50	990,138	10,373	36,672	384
B-B	9224.00	1.65	4076.00	0.10							
					6737.00	8583.00	50	555,803	42,915	20,585	1,589
C-C	4250.00	0.70	13090.00	1.20							
					2975.50	12622.50	50	104,143	757,350	3,857	28,050
D-D	1701.00	0.80	12155.00	2.10							
					6823.00	8590.00	50	272,920	901,950	10,108	33,406
E-E	233.00	0.40	5025.00	2.80							
					116.50	2912.00	25	1,165	203,840	43	7,550
F-F	0.00	0.00	799.00	3.10							

TOTAL= 71,265 CY Cut
TOTAL= 70,979 CY Fill

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FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN — PATRICK J. WILLIAMS — ENGINEER NO. 24001 — LICENSED PROFESSIONAL ENGINEER

PROJECT
Residences @ Cass Lake
3170 Orchard Lake Road
Keego Harbor, MI 48320

CLIENT
TIR Equities
217 Pierce St. Suite 209
Birmingham, MI 48009

Contact: Ara Darakjian
Email: ara.d@tirequities.com

PROJECT LOCATION
Part of the SE 1/4
of Section 2
T.2N., R.10E.
City of Keego Harbor,
Oakland County, Michigan

SHEET
P.U.D. -
Floodplain Cut / Fill Plan
and Cross Sections

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06-13-23	Revised per Owner / Arch.
06-21-23	Revised per Landscape Arch.
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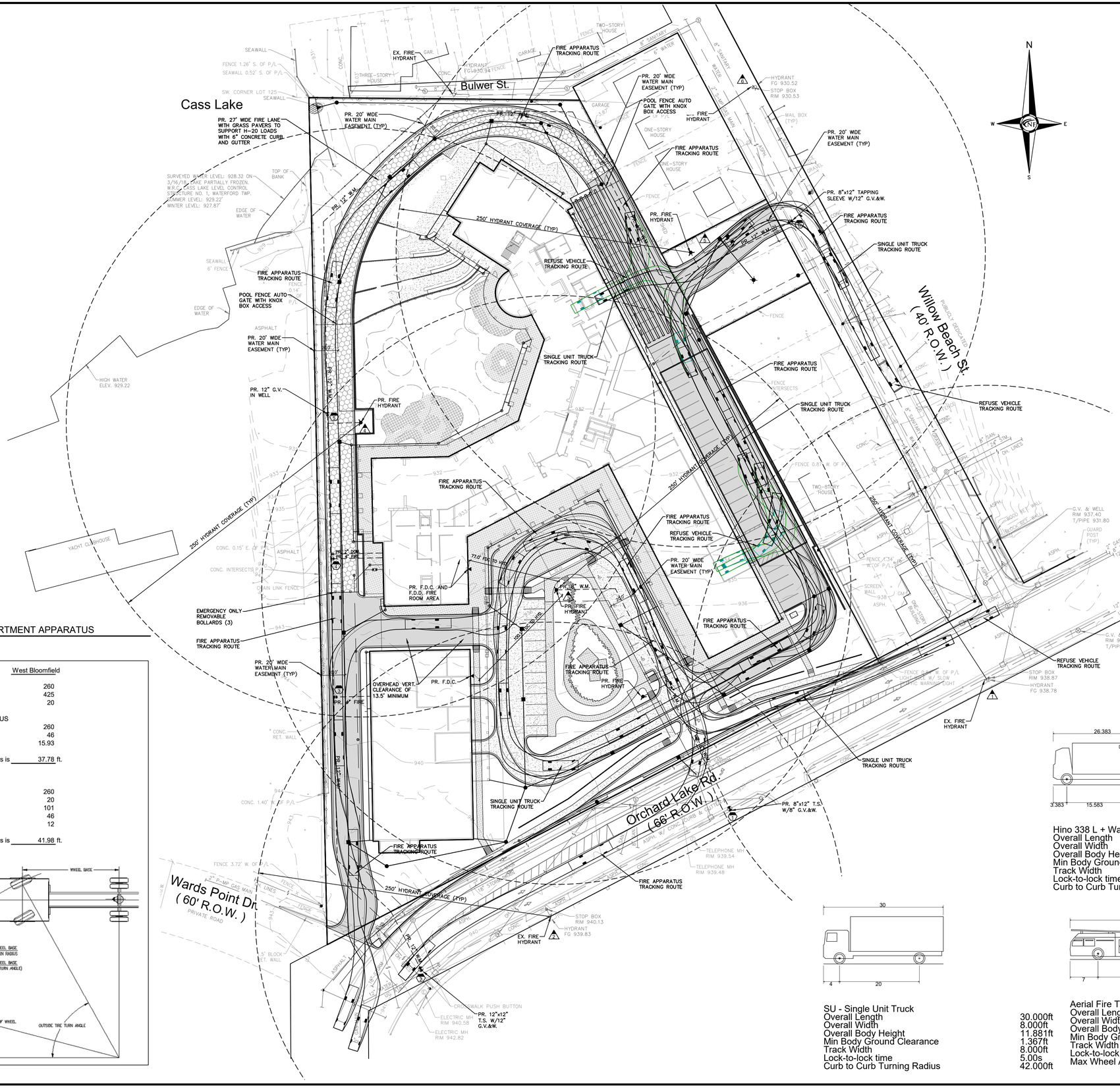
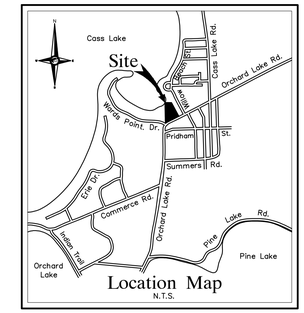
DRAWN BY: A. Wiseman
DESIGNED BY: A. Wiseman
APPROVED BY: P. Williams
DATE: April. 26, 2023
SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. K308
SHEET NO. C-07





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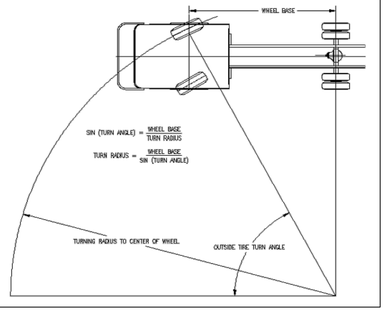
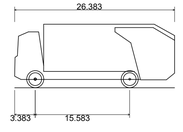
- DRAINAGE AREA LIMITS
- PROPOSED SILT FENCE
- LIMITS OF SOIL DISRUPTION

W. BLOOMFIELD FIRE DEPARTMENT APPARATUS

FIRE DEPARTMENT NAME	West Bloomfield
Wheel Base:	260
Tire Size:	425
Bumper Extension:	20
OUTSIDE CURB TO CURB TURNING RADIUS	
Input wheelbase?	260
Input front wheel INSIDE turn angle?	46
Input offset from kingpin to outside of wheel	15.93
Turn radius is	37.78 ft.
WALL TO WALL TURNING RADIUS	
Input wheelbase?	260
Input length of extension?	20
Input width of extension?	101
Input front wheel INSIDE turn angle?	46
Input radius at front corner?	12
Turn radius is	41.98 ft.



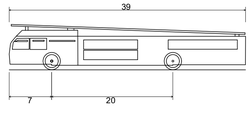


Hino 338 L + Wayne Royal GT14 Refuse Truck

Overall Length	26.383ft
Overall Width	8.042ft
Overall Body Height	10.488ft
Min Body Ground Clearance	1.318ft
Track Width	8.042ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	25.200ft

SU - Single Unit Truck

Overall Length	30.000ft
Overall Width	8.000ft
Overall Body Height	11.881ft
Min Body Ground Clearance	1.367ft
Track Width	8.000ft
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	42.000ft



Aerial Fire Truck

Overall Length	39.000ft
Overall Width	8.167ft
Overall Body Height	7.500ft
Min Body Ground Clearance	0.750ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

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PROJECT LOCATION

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of Section 2
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City of Keego Harbor,
Oakland County, Michigan

SHEET

P.U.D.
Fire Apparatus and
Vehicle Maneuvering Plan

Know what's below Call before you dig.

DATE	ISSUED/REVISED
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06-13-23	Revised per Owner / Arch.
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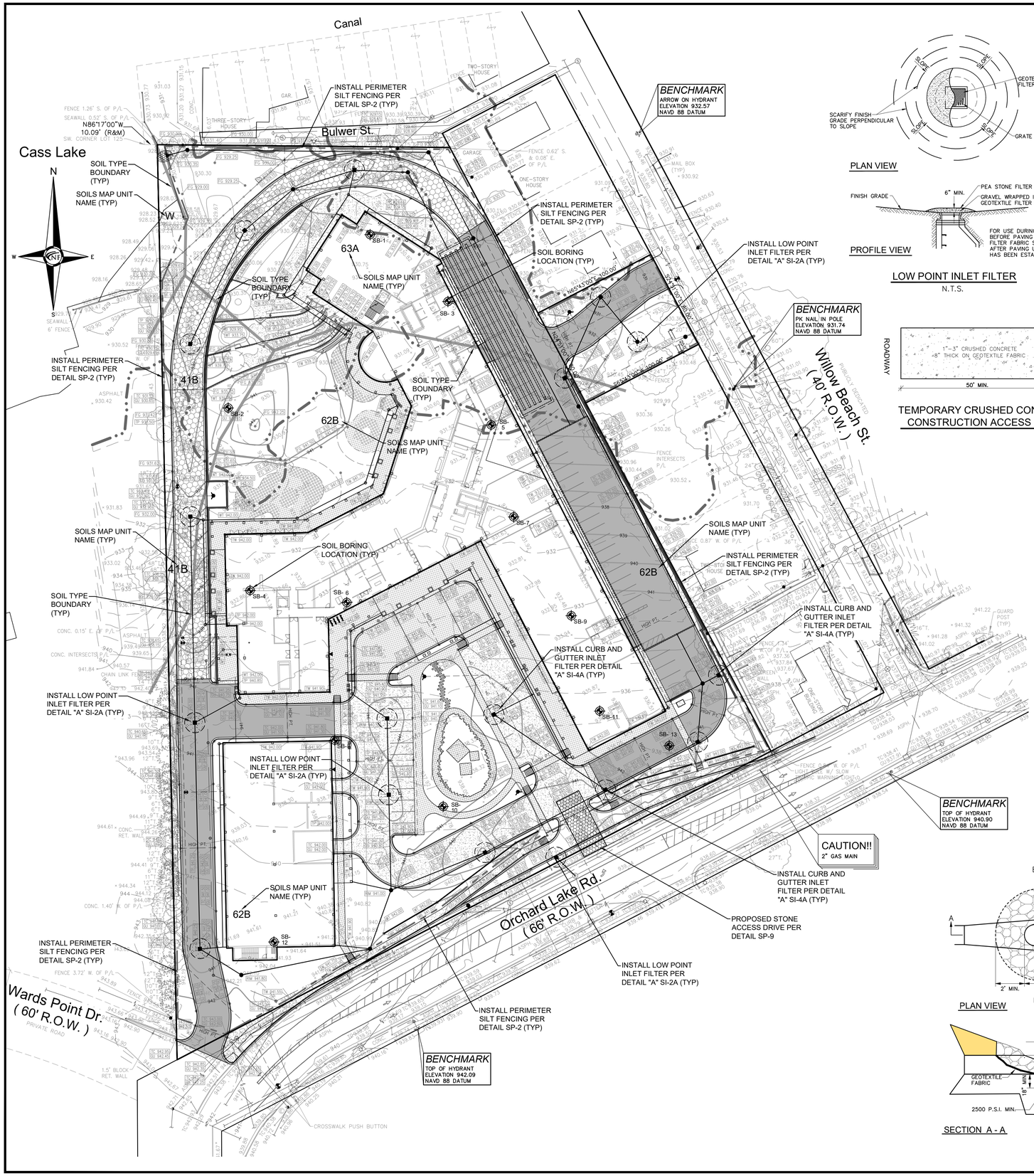
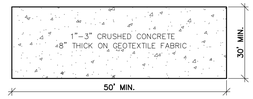


LOW POINT INLET FILTER
N.T.S.



TEMPORARY CRUSHED CONCRETE CONSTRUCTION ACCESS ROAD

SOIL EROSION CONTROL

CUTTING, FILLING AND GRADING SHALL BE MINIMIZED AND THE NATURAL TOPOGRAPHY OF THE SITE SHALL BE PRESERVED TO THE MAXIMUM POSSIBLE EXTENT, EXCEPT WHERE SPECIFIC FINDINGS DEMONSTRATE THAT MAJOR ALTERATIONS WILL STILL MEET THE PURPOSES AND REQUIREMENTS OF THIS ORDINANCE.

DEVELOPMENT SHALL BE STAGED TO KEEP THE EXPOSED AREAS OF SOIL AS SMALL AS PRACTICABLE.

SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED BETWEEN THE DISTURBED AREA AND ANY WATERCOURSES, INCLUDING RIVERS, STREAMS, CREEKS, LAKES, PONDS AND OTHER WATERCOURSES; WETLANDS; OR ROADWAYS ON OR NEAR THE SITE.

SEDIMENT RESULTING FROM ACCELERATED SOIL EROSION SHALL BE REMOVES FROM RUNOFF WATER BEFORE THAT WATER LEAVES THE SITE.

TEMPORARY AND PERMANENT SOIL EROSION CONTROL MEASURES DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF WATER AROUND, THROUGH, OR AWAY FROM THE SITE SHALL BE DESIGNED TO LIMIT THE WATER FLOW TO A NON-EROSIVE VELOCITY.

TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE REMOVED AFTER PERMANENT SOIL EROSION CONTROL MEASURES HAVE BEEN IMPLEMENTED. ALL SITES SHALL BE STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES.

IF LAKES, PONDS, CREEKS, STREAMS, OR WETLANDS ARE LOCATED ON OR NEAR THE SITE, EROSION CONTROL MEASURES WHICH DIVERT RUNOFF AND TRAP SEDIMENT MUST BE PROVIDED AT STRATEGIC LOCATIONS. STRAW BALE BERMS MAY BE USED AS TEMPORARY STORMWATER DIVERSION STRUCTURES, BUT WILL NOT BE CONSIDERED SUFFICIENT FOR TRAPPING SEDIMENT. THE USE OF SEDIMENT BASINS, FILTER FABRIC, VEGETATED BUFFER STRIPS, AND ROCK FILTERS IN LIEU OF STRAW BALE BERMS SHALL BE STRONGLY ENCOURAGED. OTHER MEASURES MAY BE REQUIRED IF REASONABLY DETERMINED TO BE NECESSARY TO PROTECT A WATERCOURSE OR WETLAND.

WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHEN SIGNIFICANT EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED.

PERMANENT EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 15 (FIFTEEN) CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED.

VEGETATED BUFFER STRIPS SHALL BE CREATED OR RETAINED ALONG THE EDGES OF ALL LAKES, PONDS, CREEKS, STREAMS, OTHER WATERCOURSES, OR WETLANDS.

EROSION AND SEDIMENTATION CONTROL MEASURES SHALL RECEIVE REGULAR MAINTENANCE TO ASSURE PROPER FUNCTIONING.

ALL GRADING PLANS AND SPECIFICATIONS, INCLUDING EXTENSIONS OF PREVIOUSLY APPROVED PLANS, SHALL INCLUDE PROVISIONS FOR EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH, BUT NOT LIMITED TO, THE STANDARDS CONTAINED IN THE "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PUBLISHED BY THE OAKLAND COUNTY WATER RESOURCE COMMISSIONER.

SOIL EROSION CONTROL - SEQUENCE OF OPERATION (NEW CONSTRUCTION)

INSTALL CRUSHED CONCRETE ACCESS DRIVE AND TEMPORARY CULVERTS AT THE SITE ENTRANCE AS INDICATED ON THE PLANS.

INSTALL SILT FENCE OR SIMILAR APPROVED SILT BARRIER ALONG PROPERTY LINES AND AROUND SENSITIVE NATURAL FEATURES AS INDICATED ON THE PLANS.

EXCAVATE A SHALLOW SWALE/DITCH AROUND PERIMETER OF SITE. GRADE THE TEMPORARY SWALE TO AN EXISTING DRAINAGE FACILITY. PLACE OUTLET FILTER IN EXISTING UPSTREAM STORM SEWER FACILITIES.

IF INDICATED ON CONSTRUCTION PLANS, SEDIMENTATION BASINS, DETENTION POND, ETC., SHALL BE CONSTRUCTED PRIOR TO THE INSTALLATION OF ANY OTHER WORK.

STRIP EXISTING TOPSOIL, VEGETATION AND ORGANIC MATTER FROM BUILDING PAD AND PARKING AREAS. COMMENCE LAND BALANCE AND MASS GRADING OPERATIONS. MAINTAIN A MINIMUM BUFFER OF 15' OF EXISTING VEGETATION WHEREVER POSSIBLE AROUND SITE PERIMETER. STOCK PILES SHOULD BE LOCATED AWAY FROM EXISTING DRAINAGE FACILITIES.

EXCAVATE AND INSTALL UNDERGROUND UTILITIES. INSTALL PEASTONE INLET FILTERS AROUND ALL NEW STORM SEWER FACILITIES AS INDICATED ON THE PLANS. EXISTING AND PROPOSED STORM SEWER FACILITIES SHALL BE PROTECTED FROM EROSION AND SEDIMENT INFILTRATION AT ALL TIMES.

COMMENCE FINAL GRADING AND TRIMMING OPERATIONS. PREPARE SUBGRADE FOR INSTALLATION OF PROPOSED PAVEMENT.

SEED AND MULCH ALL DISTURBED SITE AREAS AND INSTALLED SITE LANDSCAPING.

REMOVE CONSTRUCTION DEBRIS AND JET VAC NEWLY INSTALLED STORM SEWER SYSTEM AS REQUIRED BY THE MUNICIPALITY.

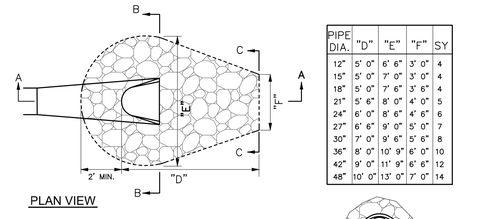
REMOVE ALL REMAINING TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ONCE PERMANENT MEASURES ARE ESTABLISHED.

WHENEVER POSSIBLE, THE SITE SHALL BE GRADED TO WITHIN SIX INCHES (6") OF THE PROPOSED FINISH GRADE PRIOR TO INSTALLATION OF UNDERGROUND FACILITIES.

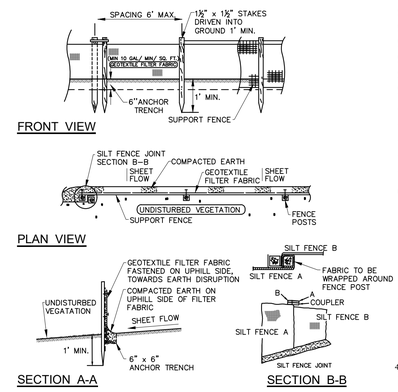
STAGING OF PROPOSED WORK SHALL BE COMPLETED BY THE CONTRACTOR AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED AREAS.

SOILS CLASSIFICATION LEGEND

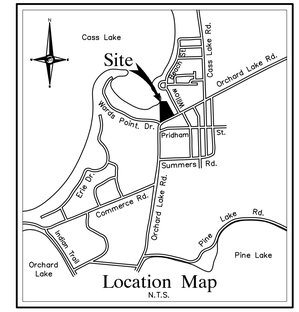
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
41B	Aquents, sandy, loamy, undulating	0.3	5.2%
62B	Urban land-Spinks complex, 0 to 8 percent slopes	4.6	81.0%
63A	Urban land-Thetford complex, 0 to 3 percent slopes	0.8	13.5%
W	Water	0.0	0.4%
Totals for Area of Interest		**5.7**	**100.0%**



GROUTED STONE RIP-RAP
N.T.S.



SILTFENCE DETAIL
NTS



LEGEND

- CLEAN-OUT / MANHOLE — EXISTING SANITARY SEWER
- HYDRANT / GATE VALVE — EXISTING WATER MAIN
- INLET / RYCB / MANHOLE / CB — EXISTING STORM SEWER
- EXISTING BURIED CABLES
- EXISTING GAS MAIN
- UTILITY POLE / GUY POLE / GUY WIRE — EXISTING OVERHEAD LINES
- EXISTING LIGHT POLE / EXISTING SIGN
- C.O. / MANHOLE — PR. SANITARY SEWER
- HYDRANT / GATE VALVE — PROPOSED WATER MAIN
- INLET / RYCB / MANHOLE / CB — PROPOSED STORM SEWER
- COMPACT TO 95% MAX. DENSITY — PR. SAND BACKFILL
- A — UTILITY CROSSING
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PROPOSED GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PAVEMENT ELEV.
- FG 600.00 — PROPOSED FINISH GRADE
- 600 — PROPOSED CONTOUR
- PROPOSED SWALE
- PR. DRAINAGE DIRECTION
- PROPOSED INLET FILTER
- DRAINAGE AREA LIMITS
- PROPOSED SILT FENCE
- LIMITS OF SOIL DISRUPTION

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED GRASS PAVERS

SEE LANDSCAPE PLANS FOR ALTERNATIVE PAVING MATERIALS

ESTIMATED QUANTITIES

DESCRIPTION	QUANTITY	UNITS
SILT FABRIC FENCING (SP-2)	1,732	L.F.
CURB & GUTTER INLET FILTER (SI-4A)	8	EA.
LOW POINT INLET FILTER (SI-2A)	8	EA.
REAR YARD INLET FILTER (SI-3A)	4	EA.
CONSTRUCTION ACCESS ROAD (SP-9)	1	LS

NOTE

APPROXIMATE GROSS ACREAGE DISTURBED: 5.24 ACRES

NOTE

THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994 AS AMENDED. THE SOIL EROSION & SEDIMENT CONTROL ACT.

NOTE

THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY THE CONTRACTOR.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN — PATRICK J. WILLIAMS — ENGINEER NO. — REGISTERED PROFESSIONAL ENGINEER

PROJECT
Residences @ Cass Lake
3170 Orchard Lake Road
Keego Harbor, MI 48320

CLIENT
TIR Equities
217 Pierce St. Suite 209
Birmingham, MI 48009

Contact: Ara Darakjian
Email: ara.d@tirequities.com

PROJECT LOCATION
Part of the SE 1/4
of Section 2
T.2N., R.10E.
City of Keego Harbor,
Oakland County, Michigan

SHEET
P.U.D. -
Soil Erosion and
Sedimentation Control Plan

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
05-03-23	Revised per City / Owner
06-13-23	Revised per Owner / Arch.
06-21-23	Revised per Landscape Arch.
06-28-23	Revised per Landscape Arch.
07-05-23	Revised per Architect
07-10-23	Final PUD Submittal

DRAWN BY: A. Wiseman
DESIGNED BY: A. Wiseman
APPROVED BY: P. Williams
DATE: April. 26, 2023
SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. K308
SHEET NO. C-09