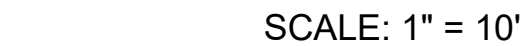
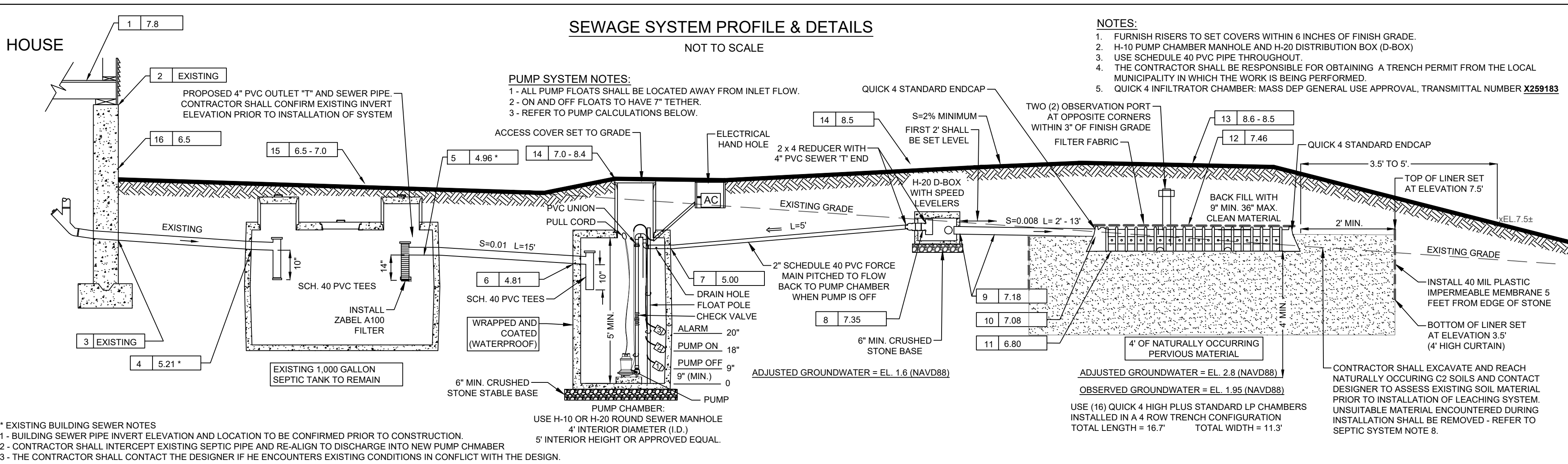




1	FIRST FLOOR =
2	TOP OF FOUNDATION =
3	PIPE INV. AT FOUNDATION =
4	INV. OF PIPE AT SEPTIC TANK INLET =
5	INV. OF PIPE AT SEPTIC TANK OUTLET =
6	INV. OF PIPE AT PUMP CHAMBER INLET =
7	INV. OF PIPE AT PUMP CHAMBER OUTLET =
8	INV. OF PIPE AT D-BOX INLET =
9	INV. OF PIPE AT D-BOX OUTLET =
10	INV. OF PIPE AT LEACHING FIELD INLET =
11	BOTTOM OF LEACHING FIELD =
12	TOP OF INFILTRATOR UNITS (FILTER FABRIC) =
13	FINISHED GRADE OVER LEACHING FACILITY =
14	FINISHED GRADE OVER D-BOX =
15	FINISH GRADE OVER SEPTIC TANK =
16	FINISH GRADE AT FOUNDATION =



NOT TO SCALE



\* EXISTING BUILDING SEWER NOTES

1 - BUILDING SEWER PIPE INVERT ELEVATION AND LOCATION TO BE CONFIRMED PRIOR TO CONSTRUCTION.

2 - CONTRACTOR SHALL INTERCEPT EXISTING SEPTIC PIPE AND RE-ALIGN TO DISCHARGE INTO NEW PUMP CHAMBER

3 - THE CONTRACTOR SHALL CONTACT THE DESIGNER IF HE ENCOUNTERS EXISTING CONDITIONS IN CONFLICT WITH THE DESIGN

Depth from surface in inches	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottles and Depth	Other Relative Factors
DEEP OBSERVATION HOLE TP#1, ELEVATION 5.7					
0 - 13	FILL				
13 - 20	A	SANDY LOAM	10 YR 2/2		
20 - 36	B	SANDY LOAM		NO	STONES
36 - 49	C1	SANDY LOAM	10 YR 7/4	YES @ 35"	STONES
49 - 97	C2	MEDIUM SAND	10 YR 6/6	YES	STONES

PERCOLATION RATE = < 2 MINUTES / INCH IN C2 LAYER  
DEPTH TO GROUNDWATER = WEEPING AT 45" DEPTH (EL. 1.95'), STANDING AT 57" DEPTH (EL. 0.95')  
ADJUSTED HIGH GROUNDWATER = ADJUSTED AT 35" DEPTH FROM REDOX, ELEVATION 2.8' (NAVD88)  
OBSERVATIONS BY: RAÚL LIZARDI-RIVERA, P.E.  
WITNESSED BY: TERRI GUARINO, R.S.  
DATE TESTED: DECEMBER 14, 2020

1. PROPOSED SEPTIC LEACHING SYSTEM SETBACK TO COASTAL BANK:	65 FEET
2. PROPOSED SEPTIC LEACHING SYSTEM SETBACK TO SALT MARSH:	67 FEET
3. PROPOSED SEPTIC LEACHING SYSTEM SETBACK TO MEAN HIGH WATER:	81 FEET
4. AREA OF TEMPORARY DISTURBANCE IN LAND SUBJECT TO COASTAL STORM FLOWAGE:	900 S.F.

THE LIMIT OF WORK WILL BE INSTALLED PRIOR TO ANY WORK, EXCAVATION, CONSTRUCTION OR CLEARING OF VEGETATION, IN ORDER TO PREVENT DAMAGE TO THE INTERESTS OF THE ACT AND BYLAW. THE LIMIT OF WORK WILL CONSIST OF A ROW OF STAKED SEDIMENT STOP OR COMPOST ROLL WITH SILT FENCE BACKING. THE SEDIMENT STOP ROLL WILL BE REPLACED AS NECESSARY TO BE MAINTAINED IN GOOD CONDITION THROUGHOUT THE EXCAVATION PERIOD, AND NO FILL WILL BE ALLOWED TO BE PLACED AGAINST THE LIMIT OF WORK AT ANY TIME. UPON COMPLETION OF ALL CONSTRUCTION AND STABILIZATION OF THE SITE, SEDIMENT STOP ROLL WILL BE REMOVED AND PROPERLY DISPOSED OF.

NO DEBRIS, EQUIPMENT OR MATERIALS WILL BE STORED, EVEN TEMPORARILY, OUTSIDE THE DESIGNATED LIMIT OF WORK AREA WITH THE EXCEPTION OF EQUIPMENT AND MATERIALS RELATED TO THE PLANTINGS FOR THE REQUIRED MITIGATION.

THE CONSTRUCTION SITE WILL BE CLEANED DAILY TO REMOVE ANY LOOSE DEBRIS.

ALL DISTURBED AREAS WITHIN THE LIMIT OF WORK REQUIRING RESTORATION WILL BE STABILIZED TO PREVENT EROSION. STABILIZATION WILL BE DONE IMMEDIATELY FOLLOWING COMPLETION OF CONSTRUCTION.

WORK AREA LIES COMPLETELY WITHIN PREVIOUSLY DISTURBED BUFFER ZONE AREAS.

■ CB	-----	CONCRETE BOUND
■ SB	-----	STONE BOUND
■ SC	-----	RSD CAP
○ IP	-----	IRON PIPE FOUND
○ H	-----	HYDRANT
○ W	-----	WATER SHUTOFF
○ CH	-----	CH BASIN SQUARE
○ U	-----	UTILITY POLE
○ G	-----	GUY POLE
○ W	-----	GUY WIRE
○ L	-----	LIGHT POLE
⌢	-----	SIGN
⌢	-----	CONIFEROUS TREE
⌢	-----	DECIDUOUS TREE
~~~~~		TREE LINE
~~~~~		OVERHEAD WIRES
○	-----	STONE WALL
○	-----	POST & RAIL FENCE
□	-----	STOCKADE FENCE
□	-----	PICKET ROW
xx	-----	CHAIN LINK FENCE
xx	-----	LIMIT OF WORK/CONSTRUCTION
-----		TYPE OF COASTAL BANK
-----		FLOOD ZONE BOUNDARY
-----		MEAN HIGH WATER (MHW)

1. TYPE OF ESTABLISHMENT: 2-BEDROOM RESIDENCE
2. SEWAGE SYSTEM DESIGN FLOW: 110 GALLONS PER BEDROOM =  $110 \times 2 = 220$  GPD
3. NOTE: THIS SEPTIC SYSTEM IS NOT DESIGNED FOR A GARBAGE GRINDER
4. KEEP EXISTING 1,000 GALLON SEPTIC TANK
5. DESIGN PERCOLATION RATE: ASSIGNED LESS THAN 5 MINUTES PER INCH
6. SOIL ABSORPTION SYSTEM TYPE: INFILTRATOR CHAMBER BED SYSTEM
7. LEACHING AREA REQUIRED: MINIMUM  $220 \text{ GPD} \div (0.74 \text{ GPD/S.F.} \times \text{CLASS I SOIL}) = 297 \text{ S.F.}$
8. LEACHING SYSTEM PROPOSED: 4 ROWS OF 4 INFILTRATOR CHAMBERS FOR A TOTAL OF 64 S.F.
9. ADDITIONAL LENGTH BY STANDARD ENDCAP =  $1.1 \text{ FEET PER PAIR OF ENDCAP (4 TOTAL)} = 4.4 \text{ F.L.}$
10. EFFECTIVE LEACHING AREA PER LINEAL FEET =  $4.4 \text{ F.L.} \div \text{L.F. OF CHAMBER}$
11. TOTAL AREA PROPOSED =  $(64 \text{ F.L.} + 3.3 \text{ F.L.}) \times 4.75 \text{ S.F./L.F.} = 323.5 \text{ S.F.}$
12. LEACHING SYSTEM CAPACITY PROPOSED =  $323.5 \text{ S.F.} \times 0.74 \text{ GPD/S.F.} = 239 \text{ GPD}$

PROPOSED PUMP DISCHARGE RATE = 47 GALLONS PER MINUTE (GPM) @ 8.5 TDH  
 PROPOSED DOSE PER CYCLE = 220 GALLONS (3 + 73 GALLONS)

PUMP CHAMBER SIZE: 4" INTERIOR DIAMETER X 5" INTERIOR HEIGHT MINIMUM  
 DEPTH OF DOSE = (73 GAL/48 GAL/CU.FT.) / (2 FT. X 2 FT. X 3.14 FT.) = 0.75 FT.  
 DEPTH OF DAILY FLOW = (220 GAL/48 GAL/CU.FT.) / (2 FT. X 2 FT. X 3.14 FT.) = 2.34 FT

FRICITION LOSS CALCULATIONS:

1. VERTICAL HEAD LOSS:  
 EL. 770 (D-BOX INLET CROWN) - EL. 100 (PUMP CHAMBER BOTTOM) = 6.7 FT.

2. FRICTION HEAD LOSS:  
 5 FT OF 2" PVC PIPE X 5.87 /100 FT. @ 45 GAL./MIN = 0.29 FT.  
 3. MINOR HEAD LOSS FROM FITTINGS (EQUIVALENT LENGTH OF 41 FT.) =  
 41 FT OF 2" PVC PIPE X 5.87 FT./100 FT. @ 45 GAL./MIN = 2.40 FT.

TOTAL HEAD LOSS = 6.7 FT. + 0.29 FT. + 2.40 FT. = 9.4 FT. AT 45 GALLONS PER MINUTE

USE LIBERTY MODEL FL-30 SERIES 1 1/2 HP. RATED AT 45 G.P.M. FOR 9.4 FT. OF HEAD (OR EQUAL)  
 ESTIMATED PUMP RUN TIME PER DOSE = 1.6 MINUTES

NO	DESCRIPTION	BYLAW REQUIRED	TITLE 5 REQUIRED	PROPOSED	WAIVER
1	SOIL ABSORPTION SYSTEM TO GROUNDWATER	5 FT.	5 FT.	4 FT.	1 FT.
2	SOIL ABSORPTION SYSTEM TO PROPERTY LINE	10 FT.	5 FT.	5 FT.	5 FT.
3	SOIL ABSORPTION SYSTEM TO STREET	10 FT.	10 FT.	2 FT.	8 FT.
4	PUMP CHAMBER TO FOUNDATION	10 FT.	10 FT.	6 FT.	4 FT.
5	SOIL ABSORPTION SYSTEM TO WETLAND	150 FT.	50 FT.	65 FT.	85 FT.
6	EXTENT OF UNSUITABLE SOIL STRIPOUT	5 FT.	5 FT.	2 FT.	3 FT.

LOCATIONS ARE BASED ON AN "ON THE GROUND" INSTRUMENT SURVEY AND ELEVATIONS BASED ON THE NAVD 1988 DATUM. COORDINATE SYSTEM USED IS THE MA-MAINLAND COORDINATE SYSTEM, DATUM: NAD 83. UNITS: U.S. SURVEY FEET.

THE FINISHED FLOOR ELEVATION (FIN. FL. EL.) SHOWN HEREON IS BASED ON AN ASSUMED 1" LOWER THAN THE SURVEYED THRESHOLD ELEVATION. AN INTERIOR INSPECTION OF BUILDINGS WAS NOT PERFORMED.

ZONING DISTRICT: R-40

PROPERTY IS LOCATED WITHIN AN AREA HAVING A ZONE DESIGNATION OF AE (ELEV 15 AND 16) BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO. 25001C0501J, WITH A MAP EFFECTIVE DATE OF JULY 16, 2014.

THIS LOT IS NOT LOCATED WITHIN A DEP APPROVED ZONE II WELLHEAD PROTECTION AREA.

THIS LOT IS NOT MAPPED WITHIN A MESA NATURAL HERITAGE AND ENDANGERED SPECIES AREA

DEED REFERENCE: CERTIFICATE 20108

OWNER: THOMAS TABORELLI

1. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5 (310 CMR 15.00), AND THE LOCAL BOARD OF HEALTH.
2. THERE SHALL BE NO CHANGES MADE IN THIS PLAN WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER AND LOCAL BOARD OF HEALTH.
3. ALL ERRORS, OMISSIONS, AND CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
4. ALL DISTURBED AREAS ARE TO BE LOAMED, SEEDED AND MAINTAINED TO PREVENT EROSION.
5. FOR PROPER PERFORMANCE, SEPTIC TANK SHOULD BE INSPECTED AT LEAST ONCE A YEAR AND WHEN THE TOTAL DEPTH OF SCUM AND SOLIDS EXCEEDS 1/3 THE LIQUID DEPTH OF THE TANK, THE TANK SHOULD BE PUMPED.
6. THIS SYSTEM HAS BEEN DESIGNED FROM DATA REVIEWED AND ACKNOWLEDGED BY THE MASS. D.E.P. AND THE LOCAL BOARD OF HEALTH; AND CONFORMS WITH THE REQUIREMENTS OF THE STATE ENVIRONMENTAL CODE, TITLE 5. NO GUARANTEE OF PERFORMANCE IS EXPRESSED OR IMPLIED.
7. TEST HOLE INFORMATION SHOWN HEREIN IS LIMITED TO SOIL CONDITIONS FOUND AT THAT PARTICULAR TEST HOLE LOCATIONS AND IS NOT CONSIDERED AS A GUARANTEED OR EXPRESSED WARRANTY OF SOIL CONDITIONS BEYOND LIMITS OF SUCH TEST HOLES.
8. ALL ORGANIC AND UNSUITABLE MATERIAL MUST BE REMOVED FROM THE AREA DIRECTLY UNDER AND 5 FEET BEYOND THE PROPOSED LEACHING FACILITY. THIS AREA MUST BE BACKFILLED TO THE ELEVATIONS INDICATED ON THESE PLANS WITH SELECT ON-SITE OR IMPORTED SOIL MATERIAL. CONSTRUCTING A CURB OR GRANULAR SAND OR OTHER GRANULAR MATERIAL, FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES. MIXTURES AND LAYERS SHALL NOT BE USED. THE FILL MATERIAL SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5 - 310 CMR SECTION 15.255 (J) AND SHALL HAVE PERCOLATION RATE OF BETWEEN TWO AND FIVE MINUTES PER INCH, BEFORE AND AFTER PLACEMENT.

9. ALL STONE MUST BE DOUBLE WASHED AND FREE FROM FINES AND ANY ORGANIC MATERIAL AND MUST HAVE LESS THAN 0.2 PERCENT MATERIAL FINER THAN A NUMBER 200 SIEVE.
10. THE DESIGNER HAS NOT BEEN RETAINED BY THE CLIENT TO CONSTRUCT OR SUPERVISE THE CONSTRUCTION OF THE SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR THE PROTECTION OF INSTALLATION OF THE SYSTEM WITH THE LOCAL BOARD OF HEALTH.
11. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL OF ALL SYSTEM COMPONENTS.
12. TIGHT JOINT PIPING MATERIAL TO CONSIST OF POLYVINYL CHLORIDE (P.V.C.) SCHEDULE 40, UNLESS OTHERWISE NOTED.
13. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER FOR CONSTRUCTION INSPECTION AFTER EXCAVATION FOR THE LEACHING BED (PRIOR TO THE PLACEMENT OF STONE) AND ALSO AFTER PLACEMENT OF PIPE & STONE PRIOR TO BACKFILLING.
14. DESIGN ENGINEER SHALL CERTIFY CONSTRUCTION OF SYSTEM AND MATERIALS INSTALLED. THE CONTRACTOR SHALL PROVIDE A SIEVE ANALYSIS OF THE FILTER MATERIAL REQUIRED. AN AS-BUILT PLAN SHALL BE SUBMITTED TO THE LOCAL BOARD OF HEALTH UPON COMPLETION.

17. WATER SERVICE LINE SHALL BE LOCATED AND MARKED PRIOR TO ANY EXCAVATING AND 10' MIN. SETBACK DISTANCE FROM SAID SERVICE TO THE SEPTIC SYSTEM SHALL BE MAINTAINED.
18. ALL WATER LINES WITHIN 10' OF SEPTIC SYSTEM COMPONENTS SHALL BE SLEEVED WITHIN 4" PVC SCHEDULE 40 PIPE.



## NOTICE

UNLESS AND UNTIL SUCH TIME AS AN ORIGINAL (RED) STAMP APPEARS ON THIS PLAN NO PERSON OR PERSONS, MUNICIPAL, OR PUBLIC OFFICIAL MAY RELY UPON THE INFORMATION CONTAINED HEREIN; AND THIS PLAN IS HEREBY ACCEPTED OF, RECORDED, AND FILED FOR THE PUBLIC RECORDS OF THE COUNTY OF SAN JUAN, PUERTO RICO, BY THE CLERK OF THE COURT OF RECORDS, ON THIS 11TH DAY OF MAY, 2010.

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12/18/20	ADD SOIL TEST INFO, REVISE SEPTIC DESIGN ELEVATIONS & CALCULATIONS	RLR	RLR
DATE	DESCRIPTION	BY	CHK

PREPARED FOR:

THOMAS TABORELLI  
PO BOX 3025  
BUZARDS BAY, MA 02532-3025

PROJECT:

24 NORTH BEACH AVENUE  
BOURNE, MASSACHUSETTS

SHEET NO.: 1 OF 1

DRAWN BY: MPR	CHECKED BY: MC
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PREPARED BY



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DRAWING TITLE: SEPTIC DESIGN PLAN  
(NO INCREASE IN FLOW)

ASSESSORS INFORMATION: MAP 30.2 PARCEL 87